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British Iron Trade Association.

CONFERENCE

AT THE

WESTMINSTER PALACE HOTEL, LONDON,

JUNE 15TH, 1892.

On the Chicago Exhibition, from the Point of View of the British Iron and Steel Industries. By W. S. CAINE, President.

On the Comparative Progress of the Iron and Steel Industries of Different Countries in Reference to Production and Exports, and the Lessons to be Learned therefrom. By WILLIAM JACKS, Glasgow.

On the Laws regulating the Liability of Employers for Accidents to Workmen in Different Countries, in their Bearing on English Law and Usage. By J. STEPHEN JEANS.

BRITISH IRON TRADE ASSOCIATION,
VICTORIA MANSIONS, LONDON.

1892.



British Iron Trade Association.

CONFERENCE
OF THE
IRON, STEEL, AND ALLIED TRADES,
HELD AT THE WESTMINSTER PALACE HOTEL
ON WEDNESDAY, 15th June 1892.
W. S. CAINE, Esq., IN THE CHAIR.

A CONFERENCE, to which the leading members of the principal departments of the iron and steel industries of Great Britain were invited, was held as above, under the auspices of the British Iron Trade Association.

At the commencement of the proceedings,

The PRESIDENT said the course which the Board of Management of the British Iron Trade Association were taking in connection with this meeting was a somewhat new departure. It had been felt very desirable to take some steps that would be likely to bring the importance of the Association under the notice of the members of the trade; and they were proposing, by the conference which was now being held, and probably by similar conferences occasionally in great centres of the industries in which they were all interested, to bring the Association more closely to the knowledge of the members of the trade generally. Of course, the great importance of a conference of that kind was not necessarily in hearing papers read so much as in getting them printed and circulated afterwards, with the

authority and stamp of a Conference of the British Iron Trade Association. He was afraid that the attendance would be somewhat limited. There were many reasons operating against them. It was hardly more than a week since the meetings of the Iron and Steel Institute were held in London, and it was a little difficult to get their friends to come up two weeks in succession. Then the Royal Commission on Labour was sitting, and although some of the members hoped to look in upon the Conference before its close, a great number of those to whom they might naturally look to help them on that occasion were engaged on that important Commission. Then the General Election business going on throughout the country was probably affecting the attendance of many others.

The PRESIDENT then read the following paper:—

ON THE CHICAGO EXHIBITION, FROM THE POINT OF VIEW OF THE BRITISH IRON AND STEEL INDUSTRIES.

By W. S. CAINE, PRESIDENT.

Introductory.

AT the present time, there appears to be every promise that the Chicago Exhibition of 1893 will be one of the most important and memorable that have hitherto marked the progress of the nations in the arts of peace. It will, apparently, cover a larger area than any former exhibition; the sum to be expended in its installation will largely exceed that hitherto expended on any other exhibition of the kind; and although there was at one time a fear that local rivalries would keep aloof some of the more northern States, it is now confidently expected that the whole of the American continent will work with a will, and as one man, to make the Exhibition a success.

The great nation that promotes the forthcoming Exhibition will undoubtedly be the foremost exhibitor. The United States have made enormous strides since their Centennial Show of sixteen years ago. Then the country, although healthy and vigorous, was, comparatively, but an ordinary personage, and in some things almost an infant. Now it is a giant, and it may be expected to put forth a giant's strength alike in arts and in manufactures. Great Britain cannot, perhaps, expect to make so brave a show under any circumstances as the United States will be certain to do, even were we to do our best. But there remains the question, "Shall we do anything at all?" and the further question, "If we do anything at all, shall we, or shall we not,

do something worthy of the commercial position of Great Britain?"

It is scarcely conceivable that such an event as the holding of a great International Exhibition in a city like Chicago could fail to have a deep and abiding interest for the iron and steel industries of the world. It is, however, impossible that the Exhibition should fail to have an interest for the iron and steel trades of our own country. Such an interest may be either practical or speculative. If practical, it may either take the form of showing what we have done, and can do, or of learning and laying to heart what our American rivals have done and are doing. If merely speculative, we may content ourselves with regarding, admiring, and regretting the course of recent metallurgical progress in the United States—regarding it as an interesting economic and scientific matter of study; admiring it as an example of material progress and enterprise almost unexampled in the world's history; and regretting it from the strictly utilitarian and business-like point of view of an English ironmaster or merchant, who sees one of his most valued and important markets slip from his grasp, partly because of the impossibility of surmounting the Chinese wall of protection which has been built up around American industries—and the iron and steel industries in particular—and partly because of the apparent determination of the people of the United States, with or without a tariff, to exclude the iron products of other countries almost as if they bred a pestilence, and to supply their own requirements wholly and entirely in the time to come.

The Centennial Exhibition.

This will only be the second important occasion on which European countries have been afforded the opportunity of showing to the whole world, on American soil, their achievements in the arts of peace. The first occasion of the kind

was the Centennial Exhibition of 1876. At the latter exhibition Great Britain was perhaps not so well represented as regards her metallurgical productions as in the selection of those gentlemen who represented them. One of the most distinguished Past-Presidents of this Association, Sir Lowthian Bell, not only acted as Chairman of the jury in Group I. (minerals, mining, and metallurgy, including the machinery), but submitted, in accordance with the request of the British Government, a valuable report upon the iron and steel industries of the United States, compared with those of Great Britain, which is well worth examination at the present day, in view of the progress since attained. The Continental representatives and judges were all, in their way, notable men, including M. Louis Simonin and M. Ferd. Walton, for France; Herr E. F. Althaus, for Germany; Prof. Akerman, for Sweden; and M. Achille Jotrand, for Belgium.

It must be confessed that the show made by Great Britain at the Centennial Exhibition of 1876 was by no means equal to the reasonable expectations of our American friends, and far from what the then leading metallurgical country in the world owed to itself. Less than twenty firms exhibited in iron and steel manufactures, and thirteen awards were made, of which one half were for tin-plates. A leading Sheffield firm exhibited specimens of armour plates, and three firms showed specimens of wire. But of the great rank and file of our iron and steel industries there was next to no representation, only one leading firm having put in any appearance worth speaking of.

On the other hand, there was a large muster of continental iron manufacturers, including representatives from Russia, Spain, Sweden, Belgium, France, and Germany. At that time none of these countries had obtained much of a footing in the United States, which received all but a mere fraction of their imports of iron and steel from England. But those countries then succeeded, almost for the first time, in bringing themselves into notice, for all of them received awards. Seven awards were

given to Russian firms for cast iron, sheets, wire, crucible steel, chilled shot, &c. Belgium secured awards for bars, boiler plates, forgings, sheets, and Bessemer steel. Sweden was complimented similarly for ores, pig iron, wire, nail rod, &c. ; France for ferromanganese, spiegel iron, &c. ; Germany for malleable iron and wire, steel forgings and plates, crucible steel sheets and hoops, &c. ; and even Norway took awards for bar iron, chains, &c. The Centennial Exhibition did not, in point of fact, appear to assist Britain to maintain her reputation in the face of the world as it should have done, and there can be little doubt that it did assist other nations to improve their competitive position as against England.

English Iron in United States Markets.

It is probable that one principal cause of the comparatively poor show, judged at any rate by its extent and variety, made by England at the Centennial Exhibition, was the apprehension that we were about to lose our trade with the United States in consequence of the high tariff duties, and the then recent expansion of the American iron industry. In the five years preceding that Exhibition, there had been an immense decline of our exports of iron and steel to the United States, the principal figures for 1871 and 1875 being as under—(1 = 1000 tons) :—

Description.	Exports to the United States in	
	1871.	1875.
Pig iron	188	51
Bar, angle, bolt, &c.	64	3
Railroad	511	18
Hoops, sheets, &c.	41	11
Other iron	11	8
Steel	21	10
Total	826	101

On the face of these figures, it would almost seem as if there

could be little or no chance of ever again securing an important footing in the United States markets, and the falling-off was sufficiently rapid and pronounced to suggest the impression that the trade that was being lost, at the rate of nearly a hundred and fifty thousand tons per annum, could never again be recovered—that a year or two more, in short, would see an end of the business. Matters did not improve in the course of the next few years. On the contrary, in the year 1878, the second year following the Centennial, our total exports of iron and steel to the United States, under the above heads, only amounted to 47,000 tons, so that there had been a further decline since the year preceding the Centennial of more than one-half. Would it have been different if Great Britain had done more to advertise herself at that Exhibition? There was, at any rate, a chance that this might have been the case; and in any event she would, if she had put forth her full strength, have proved her then immense superiority over other iron-producing countries. It is natural, no doubt, that English manufacturers should take this for granted. They had been the pioneers, and they had long had, in relation to the metallurgic arts, a position that could be conceded to no other country. But in these days nations have short memories, and are accustomed to take short views. They do not assume that any country enjoys incontestable superiority. They "ask for a sign," and in iron-making, as in other departments of business, it is to be feared that the most effectual sign is constant, and persistent, and judicious advertising.

In American affairs, and especially in American trade requirements, it is often, if not always, the unexpected that happens. The trade that had sunk to the lowest depths of the trough was again mounting on the crest of the wave a few years later. From the trifling total of 47,000 tons in 1878, our exports to the United States (again omitting tin plates, as being a special export) rose to 562,000 tons in 1879, and to 1,194,000 tons in 1880. Including tin plates, our total exports of iron

and steel to that country, in the three years ending 1881, were :—

Years.	Tons.
1879	718,000
1880	1,358,000
1881	1,162,000

And in the two latter years our American exports represented a full third of our total exports of iron and steel. It is not too much to say that to the American demand at that time we were indebted for two of the most prosperous years that the English iron trade has ever known. It may be argued that the demand came to us in spite of our partial and imperfect representation at the Centennial Exhibition, and that no doubt is so; but the question is—Did it come in as full a measure as it would have done had our participation in that Exhibition been fuller and more comprehensive?

The Future Demands of the United States.

It may, no doubt, again be argued that matters are entirely changed since 1880, and that there is no likelihood of our participating to any material extent in the fruits of the future demands of the United States—that the resources of production in that country are already a long way in excess of actual requirements, and that the American iron trade is more than equal to meeting all current and prospective demands. It must be confessed that, so far as present appearances go, this is a justifiable conclusion. But it is, nevertheless, one that would apparently fail to take account of three important factors, namely :—

1. The fact that the American tariff legislation is extremely uncertain, and that it is quite possible, if not probable, that the next attempt at “tinkering the tariff” will result in such a substantial modification of the present almost prohibitive duties as would bring about a fairer condition of competition between the two countries.

2. The fact that the American demand has always been extremely fluctuating, and that between 1872 and 1878 the production of pig iron in the United States was not only not progressive, but was actually retrogressive to a considerable

extent; so that, although in 1878 the resources of production in that country were known to be largely in excess of the actual quantity produced, and did, as a matter of fact, improve in 1880, on the make of 1878, to the extent of $1\frac{1}{2}$ million net tons, that large advance was by no means equal to the then enormous requirements of the country.

3. The fact that iron and steel cannot yet, in spite of recent improvements, be produced as cheaply in the United States as in our own country, and is not likely to be produced so cheaply under either existing or prospective economic conditions.

We have, moreover, to take account of the further fact that the American demand, although greatly attenuated as compared with some former years, is still an important item in our export trade, and amounted in 1890 to a value of not less than £6,410,000. The first table in the Appendix (A.) shows that the United States imported, in 1891, in spite of the success with which the American people prosecute the great industry at home, and a tariff duty averaging about 50 per cent. *ad val.* on all the iron and steel imported, not less than $53\frac{1}{4}$ million dollars' worth of iron and steel, set out in twenty different categories. It is true that tin plates constituted nearly 70 per cent. of the whole, but the fact that other descriptions ran to even 30 per cent. is a hopeful sign, and one that proves that we have not been wholly beaten in the race, despite the odds against us.

The iron and steel trade with the United States for the last five years is summarised in the following abstract table (1=1000):—

Exports of Iron and Steel to the United States.

Year.	Quantity.	Value.	
		Tons.	£
1886	809		5,781
1887	1,286		7,630
1888	643		5,937
1889	579		6,187
1890	530		6,411

These figures do not represent the total exports of iron and

steel from this country to the United States, as there are some minor exports that are not tabulated. The total tonnage of iron and steel imported into the United States in 1890, so far as the figures are ascertainable, was 665,771 tons, so that our own country has the largest share of the trade. The total value of the imports of iron and steel into the United States in 1890 was close on nine millions sterling, and even in 1891, in spite of the tariff, it was over eight millions sterling.

The British and American Iron Industry Compared.

It is not unusual to hear it argued that the future of the iron trade of the world lies with the United States, and some writers have attempted to throw discredit on our iron industry, in comparing it with that of the United States. A recent writer in *Engineering*, who appears to have access to much more or less exclusive and excellent information in reference to the forthcoming Exhibition, has said* that "we certainly shall have much to learn from the American steel manufacturers, while we shall have but little to teach, and it is difficult to see that those interested in the industry—unless in very special branches—can look for any return of the expense and trouble incurred by exhibiting ;" and again he says, in the same article, "Excepting for small and special exports, the American markets possess no interest for British iron and steel manufacturers. But if they have no reason to exhibit, and many good reasons for not doing so, they can learn useful lessons from this group—lessons which, if properly applied, will show their results in our own iron and steel works." This may or may not be true, but it is certainly not kind to English iron manufacturers, and it would not be surprising if they woke up determined to wipe out the reproach involved in the words cited.

Uncertainty of American Demands.

The question whether it is worth the while of British manufacturers to exhibit at Chicago is one that may be considered

* *Engineering*, Nov. 6, 1891, p. 523.

and determined (1) with special reference to the United States, (2) with reference to other American markets, and (3) with reference to the markets of the world generally.

So far as the United States, as such, are concerned, it certainly appears, on the face of the recent facts, as if the trade of English iron and steel manufacturers was a vanishing quantity. The imports of British iron and steel into the markets of the United States have been declining year by year for several years past. Until last year there remained to us the American market for tin plates, and now it appears as if even that last great prop of our American trade were to be knocked from beneath us by the operation of the M'Kinley Tariff. But it must not be hastily assumed that this is to continue. Some well-informed and sagacious people are of opinion that the United States will not maintain the M'Kinley Tariff. Some even go the length of affirming that the Government of that country will ultimately adopt a more or less modified free-trade policy. The Democrats, who have now the majority in Congress, are pledged to large modifications of the tariff, and although it would probably be too much to expect that the strong reaction against the M'Kinley Tariff, evidenced by the elections of November 1890, will maintain its strength, especially in the face of a Republican majority in the Senate, there is reason to suppose that the stringency of the present tariff will be relaxed by and by, and it may even be very soon. In that case, the exports of the iron and steel manufactures of the United Kingdom to the markets of the United States may possibly again reach a tolerably high figure. It is not, perhaps, to be supposed that we will again send to that country such relatively large consignments of rails, tin plates, and other commodities as we have hitherto done. But we have seen that the American markets have always been full of uncertainty and surprises, and no one can promise that they may not be equally so in the future.

Even as it is, however, the demand for foreign iron and steel on the part of the United States is not unimportant. In the calendar year 1891 the total value of the imports of iron and

steel of all kinds into that country amounted, as already stated, to about forty-two millions of dollars, or more than eight millions sterling, being nearly 7 per cent. of the total value of all American imports in the same year. Such a large volume of trade is certainly worth making an effort to retain. We may be foredoomed to lose this trade, or we may not—of that no man can speak with authority—but we will not be any more likely to retain it if, refusing to make adequate efforts, we idly fold our hands, and show that indifference to the value and the requirements of the markets of the United States which would be the surest possible means of leading the people of that country to give a preference to other countries, such as Germany and Belgium, which are fighting, inch by inch, and “brow to brow,” to secure the custom.

It should not be forgotten that England has advantages in reference to American markets that are possessed by no Continental nation. Descended from the same stock, speaking the same language, owing to a large extent the same traditions and a common history and literature, the people of the United States will probably always be ready, all other things being approximately equal, to give the mother country a preference. This is surely an incentive to our manufacturers to look well into the American imports from other countries, and to seek to ascertain why England was not preferred.

It must be admitted that Britain has not allowed other countries to gain upon her in American markets of late years. Table B. in the Appendix shows that of the total imports into the United States in 1891 (year ending June 30), over 27·27 per cent. were received from the United Kingdom, as compared with 27·15 per cent. in 1881. But while this is satisfactory, so far as it goes, it is important to note that Germany has, in the same interval, improved her position from 8·2 to 9·9 per cent., and Belgium from 1·9 to 3·0 per cent.—these two being our principal competitors in supplying iron and steel. Most other countries have, in this period, shown a decrease in their relative exports to the United States, but it may be remarked, as bear-

ing on what I have to say next, that both South and Central America have improved their relative positions.

South and Central American Demands.

If there is one territory more than another upon which the United States appears to cast watchful eyes, that territory is South and Central America. The Washington Cabinet resents European interference with the politics of those territories, and every now and again talks impressively about the Monroe doctrine as applied thereto, while the typical American manufacturer is disposed to say, "Hands off!" to the European merchant or trader who seeks either to secure, or to retain, a footing in that part of the world. So far as we are now having dealings with those regions, the American industrial appears to think that we occupy only till he chooses to come. There is no doubt that the markets of South and Central America do lie more contiguous to the United States than to any other industrial country. The Nicaraguan canal, now being constructed, will be likely to bring them nearer still. But while the American iron trade has been able to do some amount of business of late years, it is really not of much consequence, and neither does compare, nor is likely to compare, with our own. The total value of our exports of iron, steel, hardware and cutlery, tools and machinery, alone, to South and Central America in 1890 was over $8\frac{1}{2}$ millions sterling, as shown in Appendix C. The total value of the imports of *all kinds* into those countries, from the United States, in the year ended June 30, 1891, was less than 8 millions sterling. The imports of iron and steel from England were therefore greater than the total imports of all kinds from the United States (as shown in Appendix D.), which means that so far, at least, we have neither been much frightened nor hurt. But what of the future? Shall it be left to take care of itself?

It is more than probable that the Chicago Exhibition will be largely attended by the principal inhabitants, and responsible officials of the South and Central American Republics. Their

markets are, as I have just shown, already worth over $8\frac{1}{2}$ millions a year to the British iron and machinery trades. It may be, and will in all probability become, worth much more in the future.

As it is, the value of our exports to America, of iron and steel, as such alone, and not regarding cutlery, tools, or machinery, amounted in 1890 to the large sum of £13,561,000, which is just about 40 per cent. of the total value of our exports of iron and steel to all countries in the same year. This is, of course, including both the South and Central American States, as well as Canada and the United States. Not only so, but the value of our trade with these countries, in spite of the vagaries of tariff enactments, appears to increase from year to year. The increase of such value between 1886 and 1890 was upwards of £4,000,000 sterling—surely not an insignificant item in our total exports, for one industry alone. Indeed, this increase is equal almost to the whole value of our colonial trade, when Burke, speaking of our trade with our colonies, declared that in thinking of it the imagination was paralysed, and “fiction lags after truth.” The details are appended:—

*Value of our Total Exports of Iron and Steel to American Countries
(1 = 1000).*

Country.	1886.	1890.
United States	£ 5,780	£ 6,411
Mexico	39	465
Central America	27	111
Colombia	38	43
Venezuela	44	66
Ecuador	18	37
Peru	60	100
Bolivia	12	51*
Chili	243	671
Brazil	437	1,049
Uruguay	169	386
Argentina	982	2,464
Canada	1,453	1,552
Newfoundland	20	55
Total	9,322	13,561

* For 1888.

In order that the relative importance of our exports of iron and steel in our South and Central American trade may be appreciated, I present in the next table a statement of the total value of our exports to these countries in the same years, believing that it will be at once instructive and suggestive:—

Value of the Exports of the Produce and Manufactures of the United Kingdom to Central and South America in 1886 and 1890 (1 = 1000).

Country.	1886.	1890.
Mexico	£ 901	£ 1,906
Central America	679	987
Colombia	939	1,144
Venezuela	450	829
Ecuador	255	291
Peru	864	1,123
Bolivia	54	...
Chili	1,609	3,130
Brazil	6,069	7,459
Uruguay	1,254	2,043
Argentine Republic	5,191	8,416
Paraguay . . . . .	...	8
Total	18,266	27,346

Of the total exports for 1890 to the above American States, no less than £8,607,000, or about 32 per cent. of the whole, took the form of iron and steel.

Demands of China and Japan, &c.

There is no need to say much as to (3) the effect of the Chicago Exhibition on our trade with other than American countries. It is not very probable, perhaps, that whether we show at Chicago or not, our trade with European countries will be affected. Europe is not, however, what we have to look to as regards the future. There are many newer countries, with large expectations of development, that are much more entitled to consideration. Among these China and Japan claim a foremost place. The trade of Great Britain with both is still of

comparatively small dimensions. We import from China goods worth between four and five millions sterling per annum, mostly in the form of tea, and we export thither goods of the value of about $6\frac{1}{2}$ millions sterling, of which some two-thirds take the form of manufactures of cotton. As regards Japan, our imports are only worth about a million, while our exports thereto have of late years varied between three and four millions, again mainly as cotton goods. But the United States have of late considerably increased their exports to both countries, and appear anxious to do much more in the future. We may depend upon it that the Chicago Exhibition will be well worth our serious attention from this point of view.

Conclusion.

It does not appear to be necessary that I should in any way attempt to indicate what special descriptions of iron and steel might, with advantage, be exhibited at Chicago. As your President, I would naturally desire to see as full a representation of all descriptions as possible—to see, indeed, England not only well to the front, but eclipsing, in the variety and quality of her exhibits, all other countries, as we can—if we only resolve that it shall be done—easily do. But it must remain with each manufacturer to decide upon whether he shall exhibit at all, or, if he does exhibit, what form his exhibits shall take. All that I feel it incumbent upon me to do is to urge that we are not here to consider only the United States markets, whether valuable or otherwise, but we are here to consider the future of the iron trade of this country in relation to the whole of the American Continent—a very much wider question; and that, too, not in view of the present alone, but in view also of that future which we are all so anxious to see prosperous and auspicious, but which some of us, possibly, are disinclined to make the efforts needed to assist to that end.

The encouragement offered to British exhibitors at Chicago is now considerably greater than that which appeared to be

possible some months ago. Owing to the increase of the sum voted for the use of the British Royal Commission, it has been found possible to dispense with the charge originally proposed to be made for space. Exhibitors will now, therefore, have no occasion to incur any disbursements beyond that of the sum required to get their installation or exhibit together, and transport it to the Exhibition. And as regards the cost of transport, that will be comparatively low, owing to the facilities that are being offered by both shipping companies and American Railway lines. I do not think it necessary to enter into the particulars of such charges, as all the needful information may be obtained at the Society of Arts, John Street, Adelphi, the Council of which has appropriately been appointed to act as the Royal Commission. Much interesting *data* concerning the Exhibition may also be obtained from the several papers read upon it by Mr. McCormick, the United States Commissioner to this country; by Mr. James Dredge, of *Engineering*, who has been indefatigable in his efforts to promote the success of the undertaking in the mother country; and by Sir Trueman Wood, who has contributed an excellent article on the Exhibition to the *Nineteenth Century* of May last.

In conclusion, I wish to tender my thanks to Mr. J. S. Jeans, our able and indefatigable secretary, for the preparation of the statistical tables upon which this paper has been based, and without which it could not have been prepared.

APPENDIX A.

Value of the Total Iron and Steel Manufactures Imported into the United States in the Customs Year 1891, compared with 1890.

Description.	1891.	1890.
	1 = 1000 dollars.	1 = 1000 dollars.
Iron ore	2,430	2,416
Pig iron	2,019	3,683
Scrap iron	815	556
Bar iron	822	1,113
Rails	3½	4¾
Hoops or ties	413	613
Hoops, band, or scroll	144	573
Ingots, blooms, &c.	1,657	1,496
Sheets, plates, &c.	739	511
Tin plates	35,746	20,928
Wire rods	2,124	2,391
Wire, and wire ropes	747	793
Anvils	134	160
Chains	87	97
Cutlery	1,459	2,532
Files, file blanks, &c.	144	72
Firearms	1,071	1,388
Machinery	2,722	1,831
Needles	79	268
All other	2,314	1,666
Total	53,241	41,679

APPENDIX B.

Statements showing the percentages of the value of the total imports from all Countries into the United States in 1881 and 1891 (year ended 30th June).

Country.	1881.	1891.
Great Britain and Ireland—		
England	23.90	20.01
Scotland	2.37	4.56
Ireland	0.88	2.70
Total . . .	27.15	27.27
Germany	8.25	9.98
France	10.86	5.80
Belgium	1.96	3.09
Italy	1.81	1.53
Netherlands	0.90	2.66
Spain	0.92	1.51
Switzerland . . . . .	...	...
Austria-Hungary	0.22	0.11
Russia	0.24	1.16
Total from European Countries . . .	53.02	54.36
" " British North America . . .	5.92	4.67
" " Central America . . .	0.49	1.16
" " West Indies . . .	13.10	10.23
" " South America . . .	12.55	14.05
" " Asia and Oceanica . . .	11.40	11.59
" " Africa . . .	0.59	0.50
" " All other Countries . . .	2.95	3.44
Total . . .	100.0	100.0

APPENDIX C.

Values of the Exports of Iron and Steel from the United Kingdom to South and Central American States in 1890 (1 = 1000).

	Iron and Steel.	Hardware and Cutlery.	Implements and Tools.	Machinery and Millwork.
Mexico . . .	456	30	24	306
Central America . . .	111	17	12	49
Colombia . . .	43	18	17	32
Venezuela . . .	66	16	14	35
Ecuador . . .	37	3	...	2
Peru . . .	100	14	12	52
Bolivia . . .	...	...	...	...
Chili . . .	670	43	36	309
Brazil . . .	1049	131	85	637
Uruguay . . .	386	24	18	129
Argentine . . .	2478	75	47	1001
Paraguay . . .	1 $\frac{1}{2}$	...	...$\frac{1}{2}$	2 $\frac{3}{4}$
Total . . .	5397 $\frac{1}{2}$	371	265 $\frac{1}{2}$	2574 $\frac{3}{4}$

APPENDIX D.

Value of the Total Exports from the United States to Central and South American States in the Year ended June 30, 1891.

Country.	Value in Dollars.	Percentage of Total United States Exports.
<i>Central America—</i>	1 = 1000.	
Guatemala	1,971	0·22
Costa Rica	1,299	0·15
Nicaragua	1,592	0·18
Salvador	1,134	0·13
Honduras	583	0·07
Total	6,580	0·75
<i>South America—</i>		
Brazil	14,049	1·61
Venezuela	4,716	0·54
Argentine Republic	2,718	0·30
Colombo	3,108	0·36
Guianas	2,162	0·25
Chili	3,134	0·36
Uruguay	1,033	0·12
Peru	1,396	0·16
Ecuador	903	0·10
Bolivia	6	0·01
Total	33,266	3·81

DISCUSSION.

The discussion was opened by Sir P. CUNLIFFE OWEN, K.C.B., K.C.M.G., C.I.E., member of the Royal British Commission for the Chicago Exhibition, who said that in his admirable paper Mr. Caine had advanced many very excellent reasons why the iron and steel manufacturers of Great Britain might be justified in undertaking a very considerable expenditure of time and money in the preparation of an exhibit of those all-important industries in which British manufacturers for so many years led the world, but in which they had now been distanced by the United States as regarded the number of tons produced yearly, while he was assured—though on this point he could offer no opinion—that the quality of the steel manufactured on the other side of the Atlantic was in no way inferior to British steel. Nor was there any reason that he could see why it should be inferior. America learnt her methods from this country. That she had improved upon those methods in many ways was, he thought, now freely and ungrudgingly conceded. The requirements of the American engineer as to the quality of the steel he employed, either for the railroads or for the almost innumerable structures he erected with so much boldness and originality, were no less stringent than those of the English engineer. But though to-day the United States took the lead in the place Great Britain occupied only a few years ago, that was no reason why our iron and steel makers should refrain from exhibiting. Mr. Caine had shown them that even now, despite the high barrier of protection built around the American iron and steel industries, we still sent into those protected ports a large tonnage of iron and steel in various forms. He had very justly pointed out that, beyond the fact of the United States still being customers of some importance—though not of so much importance as we could wish, and will wish that they

may be in the future—the foreign buyers who would come in crowds to the Exhibition at Chicago were at present our customers; and that if the iron and steel makers of this country do not exhibit, they must be prepared to lose those customers. He would remind them that visitors to Chicago in 1893 would judge of the manufacturing capacity of the various countries represented there by the importance of the exhibits which they made, and if England made a poor exhibit of her own skill, as up to the present time there appeared some danger of her doing, and if America made a magnificent exhibit, as it was certain she would do, foreign buyers would not be satisfied with our assurance that we might have done better; they would trust to the evidence of what they saw, rather than to what they were told. And the difference in prices was not so very great after all but that the distance could be bridged by men who knew their business so well as American manufacturers knew it. They might be sure that where a Yankee trader got a footing he very soon sat down to stay. That was a very real and lively source of danger to our British trade—not to our iron and steel trade alone. He assured the members of the Iron and Steel Trade Association that they would be neglecting their own true commercial interests—he spoke of no higher interests—if they were not prepared to make the sacrifices required to present to the world a display worthy of the country, and which should be equal in quality, and surpass in advantages of price, the very best that America could do.

Mr. ROBERT M'CORMICK (Commissioner of the United States to Great Britain for the Chicago Exhibition) said that Mr. Caine's paper was so complete and exhaustive that he could really add nothing of importance. He desired, first of all, to express his appreciation, as the representative of the Chicago Exhibition, for Mr. Caine's very able argument in favour of British exhibitors taking part in that Exposition. Very many of the British manufacturers had held back, and declined to go

to the Chicago Exhibition, on account of what was really only a bugbear—the McKinley Tariff. This tariff had not interfered materially with the trade of Great Britain with the United States. He went at some length into that subject in a paper which he read before the Society of Arts on the 6th April; but he would only allude to one item—an item which had been alluded to by Mr. Caine as the one which was formerly looked upon as the prop of the British trade with the United States—namely, tin plates. He was afraid Mr. Caine had not looked at the latest reports as to the export of tin plates from Great Britain to the United States. He could not give the exact figures for the year 1890; but he could state that the export of tin plates for the first five months of 1892 showed an increase over the exports of 1891 of more than 11,000 tons. Of course there was an enormous decrease compared with the exports of last year, those exports being enormously increased by anticipation of the tariff which was to take effect on the 1st July. One word as to the trade with South America, to which Mr. Caine had alluded. The Americans were determined to have a very large share of that trade; they were disposed to divide it with British makers, but they would not say how much they were determined to keep. How far they had already gone in securing a part of this trade was best evidenced by the confirmation of a report which he had recently received from the State Department. Before the Treaty of Reciprocity with Brazil came into effect, they sent out from New York, he was ashamed to say, only two steamers a month to Brazil; to-day, they were sending out fourteen steamers per month, and the number was limited rather by their inability to secure tonnage than by a want of freight with which to load the steamers. One word as to the Nicaraguan Canal. Perhaps some gentlemen did not entirely appreciate just what that Nicaraguan Canal meant. To-day, the distance was the same from New York as it was from Liverpool to San Francisco and other Pacific slope ports; by the Nicaraguan

Canal New York would be 2500 miles nearer than Liverpool to all ports on the Pacific coast. The United States would also gain to Australia, to China, and to Japan. They would be 300 miles nearer China by the Nicaraguan Canal than Liverpool by the Suez. So that, aside from the question of the trade which Great Britain had with the United States, whether it be the iron industries or other industries, they felt that it was very important for Great Britain to exhibit at the Chicago Exhibition. The Chicago Exhibition was absolutely unique in this, that heretofore industrial exhibitions had been rather like the old-time fairs, at which the merchants gathered together their goods for sale to the visitors; such was even the English World's Fair in 1851. But the United States, though 80 per cent. of their exports were raw materials, generously invited Great Britain to come and show the goods she sold to the States, and which the States proposed hereafter not only to make for themselves, but to compete in with Great Britain in other parts of the world.

Mr. ANDREW CARNEGIE said that the President, in his very comprehensive paper, and the gentlemen who had taken part in the discussion, had said all that it was necessary to say upon the subject. Mr. Caine had given the question its proper scope. It was not a question primarily of the amount of custom which Great Britain could obtain in certain lines in America, but a question of the trade, present and prospective, in countries which were neutral territory to both, which he thought was the point of greatest importance. But he would like to give the question even a wider scope still. The relations between the two English-speaking branches were in this position: Great Britain had no other customer in the world with whom her trade had increased. Her trade with India had slightly fallen, and her trade with every nation on the face of the earth had stood stationary for the last five or ten years, save and except with the Republic; while her exports

to the Republic in the last ten years had increased 25 per cent. Was not an average of 32 millions sterling in goods sent to America a greater amount than Great Britain sent to India—much greater in amount than she sent to any other country? So that when he heard America always complained about, he felt that he should like to ask whether it made much difference from a national point of view in what special line America took British products, provided she did take them. The Republic was not only the best customer of Great Britain, but it was the only customer that Great Britain had in any part of the world which took an increasing amount of British products year after year.

There was the other point about the tariff. If British exports of crude iron and steel were a vanishing quantity, so was the tariff a vanishing quantity. They might be surprised to know—it was a fact that very few Englishmen did know—that the M'Kinley Bill reduced the duties on all forms of iron and steel from 25 per cent. to 32 per cent., including steel rails, excepting tin plates and fine cutlery. The M'Kinley Tariff was the greatest Free Trade measure that had ever been passed by the American Legislature. It took off eighteen millions sterling of revenue from imports, and it transferred 1500 articles from the dutiable list to the free list. The complaint in Great Britain perhaps some day would be, not that the Republic was not adopting the principles of Cobden, but that the Republic was marching altogether too fast in the direction of Free Trade. He had found, in his experience, that no one concern could make everything to the best advantage. He had visited many establishments, and had found that, though one firm might excel in one process, that firm could be excelled in another. So it might be with this country and with the United States. In the Republic they would never make all the iron and steel in manufactured forms that they required. They would always come to Great Britain for specialities in which she excelled them; so that, so far from

thinking, as an American manufacturer, that British trade with America in iron and steel manufactures would decrease, he would make the bold prediction that it was bound to increase. (Applause.)

The PRESIDENT said they were very much obliged for the cheering predictions which they had heard from so eminent an authority as Mr. Carnegie, and he hoped they would all be fulfilled.

Dr. BALL (Royal College of Science) said that, as a member of the Royal Commission, it had been his lot, in a recent visit to South Wales, to place himself in communication with a number of manufacturers and with business firms generally, with a view to obtaining collections or specimens of metals for the Chicago Exhibition, and he regretted to say that in the majority of these cases he had been met with the remark which had fallen from several gentlemen who were present, "What's the use of exhibiting in view of the M'Kinley Tariff?" It was rather a difficult matter—in fact, almost an impossibility—to persuade manufacturers that the M'Kinley Tariff had very little to do, as Mr. Carnegie had observed, with their trade with the United States, especially as he then happened to be in the tin-trade district, which had suffered so much. He had also placed himself in communication, either directly or through his friends, with a number of men in the iron and steel trades, and in other trades as well, and the answer had always been the same, "What is the use of exhibiting?"

The Sub-Committee which had been appointed by the Royal Commission took exactly the view that Mr. Caine did as to our exhibiting, and he considered that it was not perhaps so much the United States as the other countries which were outside the United States, which had to be borne in mind. For instance, take China and Japan. China was not specially

friendly towards the United States at present. Then there was Canada, which in the future, in its railway building, might take a good deal of our iron and steel. The Committee sincerely hoped that British manufacturers, if they did not see much to make out of it from a financial point of view, would endeavour to remember their nationality, and would make as good an exhibit as they could. Sir Trueman Wood was gathering together some details so as to ascertain exactly how much it would cost a manufacturer who wished to send small cases to this Exhibition. It would not involve much cost, but that would soon be made known. (Hear, hear.)

Mr. B. H. THWAITE said he could speak to the feeling which existed in Sheffield, Leeds, Manchester, and Liverpool with regard to this Exhibition. The general feeling now was, that instead of speaking of "our American cousins," we should speak of them as "our industrial enemies." That feeling prevented British manufacturers from making much show at the Chicago World's Fair, and it was due to the effect of the M'Kinley Tariff. Any one who knew Sheffield would be well aware that in many of the trades there the manufactories were partially closed, and the effect of the M'Kinley Tariff on the Bradford trade was certainly very substantial. The question was whether they were adopting the right policy as Englishmen in refusing to show at the World's Fair. There they had a battle-ground. Why not show, with British pluck, that they were not afraid, on a reasonable basis, of showing the world what they could do. He was very glad that Mr. Caine had read his paper, which threw an entirely new light on the whole of the circumstances. After hearing that admirable paper, one could not fail to realise that the advantages which would follow our exhibiting at the World's Fair were great and solid. There was no doubt that an adequate exhibition of our manufactures would affect favourably our hold upon the Central and South American markets, and in that connection he

might mention that nearly all the South American States had been founded with British capital. It would also affect their hold on the markets of China and Japan, especially of the former country, the natives of which passed and repassed in great numbers between San Francisco and Hong Kong. By not exhibiting at the Exhibition, they ran the risk of losing a trade worth thirty millions sterling annually.

The PRESIDENT said they must pass on to the next paper; but with regard to what Mr. Thwaite had said about Bradford, he happened to know something about that town. Not so long ago he was talking matters over with the American Consul there, and the Consul made the very practical remark that he believed the fees of the Consular Office at Bradford would be quite as large over the next five years as they had been over the last five years. He was very strongly inclined to agree with the Consul. His experience with America—and he had exported from a quarter to half a million sterling of metals to America for many years, although he did not do so now—was that if there was a good thing to be got at any price, the Americans would have it; and for that reason, so long as Great Britain could maintain, by stimulating technical education and other means, anything like supremacy in any manufacture, they might always depend upon America, of all markets in the world, as a customer. (Hear, hear.)

Mr. WILLIAM JACKS then read the following paper:—

ON THE
COMPARATIVE PROGRESS OF THE IRON AND STEEL
INDUSTRIES OF DIFFERENT COUNTRIES
IN REFERENCE TO PRODUCTION AND EXPORTS, AND
THE LESSONS TO BE LEARNED THEREFROM.

BY WILLIAM JACKS, GLASGOW.

THE subject which I have been asked to bring before this Association is one of grave and commanding importance. It may be considered as a kind of making up of the books of the iron and steel industry for the last few years. Many firms and undertakings are ruined by bad book-keeping; so is it with a nation's affairs, and so is it with the future of any great industry. The great object of this book-keeping is to let the firm know exactly where it is. The object that I have in view is to try to show what the state of the iron and steel industries is in this and other countries.

The present seems an opportune time to inquire into these matters. The iron and steel trades are, and have been for some time, in such an unfortunate, and even deplorable, condition as would give grounds for serious reflections if they were holding their own with other nations; but when we find that these industries have in Britain not only been stationary, but have largely fallen back, whilst other countries, formerly customers, now rivals and competitors, have gone forward and largely increased their production and exports, these reflections naturally lead to grave and justifiable apprehension.

This is a matter that can only be properly dealt with by the statistical method. I have, therefore, prepared certain tables, upon which I will now proceed to comment:—

I.—Table showing Total Production of Pig Iron in the World.

Year.	United Kingdom.	United States.	Germany.*	France.	Belgium.	Sweden, Austro-Hungary, and other Countries.	Totals.
1871	Tons. 6,627,179	Tons. 1,706,793	Tons. 1,297,940	Tons. 859,641†	Tons. 609,230	Tons. 1,058,000	Tons of 2240 English lbs. 12,158,783
1882	Tons. 8,493,287	Tons. 4,623,323	Tons. 3,380,805	Tons. 2,033,000	Tons. 726,946	Tons. 1,469,000	Tons. 20,726,361
1891	Tons. 7,228,496	Tons. 8,279,870	Tons. 4,452,019	Tons. 1,919,185	Tons. 688,056	Tons. 2,419,994	Tons. 24,987,620

II.—Table showing the Exports of Iron and Steel from Leading European Countries in 1890 and 1891.

	Quantities Exported.		Increase or Decrease.	Per Cent.
	1890.	1891.		
Great Britain	Tons. 4,065,452	Tons. 3,292,891	Tons. 772,561*	19·00*
Germany	Tons. 956,266	Tons. 1,158,946	Tons. 202,680†	21·19†
France	Tons. 278,265	Tons. 150,255	Tons. 128,010*	46·00*
Belgium	Tons. 434,497	Tons. 345,487	Tons. 89,010*	20·48*

* Decrease.

† Increase.

The second table raises the question, How does it happen that Germany has been able to increase her exports of iron and steel in such a declining year as 1891 by 21 per cent., whilst Great Britain has fallen off to the extent of 19 per cent., and Belgium has declined to the extent of 20·48 per cent.? Is it that Germany has taken up certain specialities, which we cannot produce, or do Germans produce cheaper or better iron or steel of descriptions that are largely called for? Or is it that they have more skill, tact, and perseverance in securing markets for their products?

In order to examine this question more narrowly, let us look into the statistics of production. The following tables show the production of finished iron and steel in Germany in 1881 and 1890 (1=1000 tons):—

* The figures for 1882 and 1891 are for the whole German Empire, including Luxembourg.

† During the Franco-German War, when production was lessened to the extent of about 400,000 tons.

III.—*Production of Finished Iron in Germany.*

Description.	1881.	1890.
Rails, &c.	37	11
Sleepers, &c.	54	16
Wheels, axles, &c.	15	16
Merchant iron	712	1,027
Plates	231	231
Tin plates	11	...
Wire	234	122
Tubes	6	16
Other products	49	47
Totals of finished iron	1,349	1,486

IV.—*Production of Steel in Germany.*

Description.	1881.	1890.
Rails and chairs	523	560
Sleepers, &c.	28	130
Wheels, axles, &c.	76	93
Merchant steel	13	308
Plates	6	186
Tin plates . . . . .	...	21
Wire	58	217
War materials	12	10
Tubes . . . . .	...	7
Other forged steel	59	81
Total forged steel	775	1,613
Grand total	2,124	3,099

This is a very remarkable development, and is not to be equalled in any other country on the European continent. It will be observed that the principal advance has been under the head of merchant iron and steel, and that the more important items of increase have been merchant steel, wire, plates, and sleepers.

According to official German returns, it would appear that the export trade of Germany has been largely created during the last twenty years. In 1871 the total quantity of iron and steel of all kinds exported from that country was 298,000 tons.

In the same year the total corresponding exports from Great Britain amounted to 3,171,581 tons. The German exports were thus about one-tenth of those of our own country. In 1891, however, the German exports had increased to 1,598,000 tons, and the exports from Great Britain had advanced to 3,240,000 tons—disregarding the intermediate variations, which were considerable—so that in the latter year the German exports were almost one-half of those of the British isles. Manifestly, therefore, Great Britain had relatively fallen back to a serious extent in the race.

The same absolutely and relatively greater increase of German progress appears in the production of iron and steel. In 1871 Germany produced only 1,563,000 tons of iron, while Great Britain produced 6,627,000 tons. Our own country, therefore, produced four and a half times the quantity produced by Germany. But in 1891 the German production had advanced to 4,452,000 tons, while the British production was only 7,228,000 tons, so that the German make had grown to more than one-half of our own.

Statistics recently prepared show the imports and exports of finished iron and steel, as such, for Germany from 1871 to 1891, as well as the percentage of the total quantity of pig iron produced in Germany that was exported in each year. It appears that the imports into Germany of finished iron and steel have not much increased during the interval. They are, in general, of special descriptions, and for all practical purposes Germany may be taken as a self-supplying nation. In 1871 the excess of exports over imports was very trifling, being less than 60,000 tons. In 1873 it was *nil*, but that, of course, was a very exceptional year. But in 1891 the excess of exports had risen to the large total of 917,000 tons, or about seventeen times as much as it was in the year 1871. During this period also, it would appear that the percentage of the total German make of pig iron that was exported had increased from 10.8 to 23.3

per cent., having in some intermediate years risen to as much as 30 per cent. of the whole.

The total quantity of finished iron and steel exported from Germany in 1891 amounted to 947,743 tons, as compared with 775,842 tons in the previous year, so that there was a total *increase* of 171,901 tons.

The total quantity of finished iron and steel exported from the United Kingdom in 1891 was 2,400,091 tons, which was a total *decrease* of 456,071 tons on the corresponding exports of the previous year.

The official returns also show that the exports of finished iron and steel from Germany to this country are much larger than the exports of the same descriptions to Germany from the United Kingdom, and that except as regards Sweden, Germany exports to all countries a much larger quantity of these descriptions than she receives therefrom.

I may further add here that to Belgium, France, the Netherlands, Austria, Hungary, Roumania, and Switzerland, Germany exports more finished iron and steel than Great Britain.

One apparent source of the success of Germany is, not that German manufacturers can produce more cheaply than our own, although in certain cases they may possibly do this, but that they are protected in their home markets, and are thereby enabled to sell in other markets, without a strict reckoning as to profits, the surplus of their works. In other words, their home prices are good enough to cover any possible loss on the surplus sent abroad.

Before proceeding to make further remarks on this matter, I would remark that the principal exports of German iron in each of the last two years were—

Description.	1891.	1890.
	Tons.	Tons.
Rails	141,476	130,837
Bar iron	193,366	142,811
Wire	98,562	83,911
Do. coated . . .	68,930	50,499
Axes, wheels, &c.	33,368	29,114
Wire nails . . .	49,708	41,040

So far as rails, axles, wheels, and, to a less extent, bar iron and wire, are concerned, there is no doubt that the Germans, by "evening" or averaging the price over the whole, find that they can take lower prices for export when they have a good year for home demands. This is largely the secret of the great increase in the exports of German iron and steel in 1890-91. During those years the German railway administration was making up a great deal of leeway previously lost. The Emperor William I. was an economist, and his Minister, Herr Maybach, met his views by spending as little on the railways of the country as possible. When his grandson, the present Emperor, came to the throne, he looked into these matters for himself, and reversed the system formerly pursued. The trade was almost deluged with home orders in the last two years at high prices. The price of rails was kept up by a combination to a minimum price of 120 marks, or close on £6 per ton. The 130,000 to 140,000 tons exported could be sold at lower prices according as there were larger orders for home requirements at higher prices, and by thus cutting prices, and selling for export at 20s. to 40s. per ton less than they sold at for home needs, the German makers could, of course, secure a large outside market in the competition with other countries like our own, which depend on export, equally with home prices, for a profit. I may add that, as the German railway administration has given out much fewer orders in respect of the current year, and as, consequently, the German works are much less fully employed, the relatively low export prices of the last two years

are not likely to be maintained, and the effects of German competition are, consequently, not likely to be so keenly felt.

The high range of prices that are realised by the German trade for home consumption will be seen on referring to the average prices of iron at works for recent years, as given in the Statistical Reports of this Association. It will be observed that the prices generally, during this period, were much higher than in this country, and much higher, also, than the prices at which materials were sold for export. All this tends to prove that the German trade is not fighting fairly. We are undoubtedly greatly handicapped in our competition in consequence of the tactics referred to, and, true to free-trade principles, declining to protect our manufacturers in their own markets, we are unable to fight our rivals with their own weapons.

So far as the official returns of German prices go, they prove that the Germans cannot generally compete with our own manufacturers in the production of pig iron. At any rate, their quoted prices are much higher, as a rule, than our own; and pig iron is, of course, the foundation of the whole matter. With pig iron at the same prices, however, our German rivals should be able to produce cheaper iron and steel in their finished forms, because of their command of much cheaper labour. The interesting memorandum drawn up by Mr. Jeans for presentation to the Royal Commission on Labour shows the extent and character of these differences, and I commend it to your consideration.

In Germany, as at home, there has been a large reduction of prices as between 1890 and 1892. Forge iron has declined to the extent of 48.2 per cent. in Westphalia, and 44.9 per cent. in Luxembourg. Steel rails in Westphalia have declined by 30.3 per cent., and wire by 36.1 per cent. All this means that German manufacturers will not be able to export this year at such relatively low prices as in 1890-91.

I cannot, in a paper like this, pretend to go into all the

differences that exist in the conditions of the manufacture of iron and steel as between Germany and England. It is well known that Germany has the command of cheap ores, especially in Luxembourg and Lorraine—these districts averaging less than 3s. per ton at the mines; but, on the other hand, the coke rates are relatively high, largely in consequence of prices being again kept up for home consumption by a combination of manufacturers.

As regards labour, it is no doubt the fact that the ordinary rates paid at German ironworks are lower than those paid in Great Britain; but the following official figures show that during 1891, at any rate, the average was considerably over 20s. per week for all classes, including boys and lads employed in the ironworks generally of Rhineland.

The average wages paid in a number of leading works in Rhineland per workman per month have varied as under during 1891, for iron and engineering works, respectively:—

1891.	Iron Works.	Engineering Works.
January	95·5	100·2
March	92·4	103·4
May	93·2	103·5
July	92·6	104·9
September	90·8	104·9
November	88·7	102·1
December	85·4	99·9

The efficiency of the German blast furnaces is now much greater than it formerly was, and this no doubt helps the iron-masters of that country in competition with our own. The average output per furnace in Germany in 1891 appears to have been as much as 25,368 tons; and in the case of the furnaces making basic pig iron, most of them presumably comparatively new plants, the average rose to 60,867 tons, which, unless very exceptionally, is probably better practice than is to be found in Britain. The average of the furnaces making each several description of pig in 1891 is appended:—

V.—*Production of Pig Iron in Germany in the year 1891, and Average Annual Output per Furnace.*

Description.	Production.	No. of Furnaces at work.	Average Production of Pig Iron per Furnace.
Forge iron and spiegeleisen .	1,747,100	66	Tons. 26,471
Bessemer pig iron .	384,196	9	42,688
Thomas pig iron .	1,704,279	28	60,867
Foundry iron and cuttings from blast furnace .	616,414	33	18,679
Total and average .	3,451,989	136	25,368

Great Britain appears to be losing its relative, if not its absolute pre-eminence as a pig iron producing and exporting country. In 1870 we produced 58 per cent., and in 1890 only 32 per cent. of the total quantity of pig iron produced by the five chief iron-making countries of the world, viz.:—Great Britain, the United States, Germany, France, and Belgium. Within the same interval, our relative production of finished iron has fallen from 43 to 26 per cent. of the total of the same countries, while our production of Bessemer steel has declined from 45 to 23 per cent.

The question naturally occurs, which of the other countries named has displaced our own? Principally the United States, which have advanced their output of pig iron from 16 to 37 per cent.; of finished iron from 22 to 37 per cent.; of Bessemer steel from 9 to 50 per cent. of the same total. To this extent, the difference is hardly seriously competitive.

Germany comes next after the United States, in the order of encroachment on our former pre-eminence, having advanced her contributions of the grand total from 11 to 19 per cent. in the case of pig iron; and from 15 to 20 per cent. in the case of finished iron; but has fallen back in reference to the percentage of the general make of steel contributed towards the total in question.

The question that is now submitted for consideration is—Why has Britain lost her relative place in the iron production of the

world? The change that has taken place may be due to either or both of two causes, viz. :—

1. To the fact that other large consumers of iron, formerly dependent on our supplies, have now more largely met their own requirements, or

2. To the fact that other iron-producing countries have competed successfully with our own in the supply of neutral markets. Obviously, if our less dominant position is due to any large extent to the second of these causes, it would be a matter of much more serious concern than if it was due to the first only, or almost solely, inasmuch as the influence of tariffs or bounties might easily shut us out—as in fact they do—from particular markets, whereas in neutral markets, competition is generally untrammelled, except in the rare cases where differential duties exercise a preponderating influence.

The figures that have already been cited show that the premier position, and the greatest strides as an iron-making country, during the last twenty years, have been taken by the United States. In other words, the United States, which formerly used to take a fifth, a fourth, and in some years even a third, of our total exports of iron and steel, have now almost ceased to take any considerable quantity from us, excepting tin plates. And not only so, but the United States have in some cases competed with us in neutral markets, and have wrested orders from British firms, both in Canada and in South America. This has been especially the case with pig iron for Canada, where the American producer has largely supplanted both Scotch and English ironmasters. The items beyond this that are chiefly exported to other countries from the United States are wire, steel rails, cut nails and spikes, and car wheels, the total quantity of these exported in 1891 having been about 45,000 tons. But the whole of these items, taken together, is but a drop in the bucket, which neither has exercised, nor can exercise, any material influence on the iron markets of the world.

With Germany and Belgium it is very different. These countries have not only, as regards finished iron and steel, reached the position of being able to meet their own requirements almost entirely, but they have assumed a formidable competitive attitude towards our own trade in most of the principal markets of the world.

The proof of this is afforded by the fact that the joint exports of these two countries, in finished iron and steel, were 36 per cent. of the total exports of Great Britain and themselves in 1890, whereas in 1870 they were not 20 per cent. of the whole. So far as pig iron is concerned, our own continues to be the great exporting country, contributing 73 per cent. of the total of the same three countries in 1890.

So far, indeed, has the competition of Germany proceeded, that in 1891 the total exports of finished iron and steel from that country to our own amounted to 98,249 tons, whereas our exports of the same description to Germany in the same year did not exceed 55,293 tons.

It is much the same in reference to our trade with Belgium, which, disregarding pig and dealing with finished iron and steel only, takes much less from our own country than she sends to it. Both countries, moreover, appear to compete with us with ever-increasing success in neutral markets. German wire, wire rods, and nails, and other special descriptions, are exported to a larger extent than our own corresponding products ; while Belgian girders, beams, and pillars, are used in the principal markets of the world more largely every year.

These are the serious facts that we are called upon to face. To what are they due ?

Is it that these countries have more thoroughly mastered the *technique* of certain manufactures, or are they favoured by the command of cheaper labour, or is it that they are more diligent in looking after new markets and more ready to accommodate themselves to their requirements, or are there any other causes which require to be considered and dealt with ?

With regard to wages, I think it will be found, although the *nominal* rate of wages paid in Germany and Belgium may be considerably lower than in Britain, that it is not entirely, or even in a large degree, to that fact that the success of Germany is due.

To my unpractised eye, in recent visits abroad, it appeared that there may be some points in which the German and Belgian producer has more economical methods, and sometimes, theoretically at least, more perfectly scientific and practical arrangements; yet upon the broad view, the improvements in the modes of production and the various inventions made by British ironmasters and those engaged in the iron and steel industries of this country, show that their scientific eye has not yet become dim, neither has their right hand lost its cunning.

But, gentlemen, there are one or two directions in which I think that we may look for an explanation, and in some of these cases I would very respectfully also suggest a policy of counteraction. With regard to the matter of labour, although it is one that, regarded as a question of direct remuneration, may not place this country at a disadvantage, yet the number and severity of the strikes that have occurred in the iron and steel industries, and in industries affecting them, in Britain have undoubtedly had a serious effect, being greater and more severe than almost any Continental strikes.

Since the nations I have mentioned have commenced competing with us in earnest, there has hardly been a strike that has not resulted in markets being lost to our industries, and gained by our competitors abroad, which have never been recaptured by this country. It is therefore most desirable, in order to regain our former pre-eminence, and even to retain our present position, that some plan and policy should be adopted to make the relationships between employer and employed more harmonious, so as to prevent, in cases of difference of opinion, the reference to the rude and barbarous arbitration of a strike or lock-out, which in either case means starvation

to the workman and his family, and loss, often ruin, to the employer, as well as the above-cited loss of markets to the country. It is suggested, first, that in the present condition of things conciliation and arbitration boards, fairly composed, with an impartial president, should be appointed, if necessary, in the different districts, with sufficient power from the State to enforce their decisions; and, second, as a still further advance in the state of industrial civilisation, that the system of profit-sharing ought to be seriously considered and investigated by all those interested in our great industries.

Mr. Rawson's book on this subject gives most interesting information, and so far as I have been able to ascertain, in the numerous works which are carried on in various countries on this system, things work more harmoniously than where it is not adopted.

In one respect the protection policy of Germany helps them in the meantime, though any thoughtful man must feel it can but be in the meantime only. We have seen that they get large prices for goods consumed at home, and accept orders for goods exported at prices calculated not so much on the cost of production of that specific order, as mainly upon the price of the producers of other countries, and in this they are materially assisted by the rebate, or, I should perhaps say, the exemption from duty allowed by the Government on material destined for manufacture and export. I remember, a few years ago, going through a work in Germany, the managing partner of which happened to be an old acquaintance of my own, and I was told of the following transactions. Courtesy naturally prevents me revealing the name, the real class of manufactures, or the actual prices, but, though I may state them under different names, the facts and comparative figures are correct. We will call it a rail work. I asked for whom a particular lot of rails was intended, and was told it was for a certain home railway which took delivery on trucks at works, and paid £6 5s. per ton. Remember this was a few years ago. "How," I asked, "do

you get this price?" "Well," he said, "the price in Britain is — ; freight to Stettin—the best port, — ; duty, — ; inland carriage, — ." Another lot was destined for the Russian market. The price was £5 7s. 6d., that is, 17s. 6d. per ton lower than the price at works, and out of it the inland carriage and freight to Cronstadt had to be paid, say 15s., making £1 12s. 6d. difference, and the section of rail was less favourable. The mode of calculation adopted was the same. He said that this difference of price was not all loss, because it enabled him to keep his works in full employment, and, in this way, materially reduced the on-cost on the full production.

Now, gentlemen, we, as a free-trade nation, cannot imitate this policy. Of course the German nation as a whole, it will be seen, pays for any loss there may be on the export order, by the heavy price paid for the home work. We can only trust to time to cure this, as it cures so many errors, and to awaken the great and intelligent German people to the errors of the delusive system of protection.

The third probable cause is the difference in royalties, which, though seemingly unimportant on the ton of raw material, is material when followed to the finished article. Leaving aside the unascertained percentage of dead rents, we find that royalties on coal range in this country from $4\frac{1}{2}$ d. to 1s. 6d. per ton, or, say, an average of $7\frac{1}{2}$ d., and on iron ore they may reach an average of 6d.

Two tons of slack make one ton of coke, and I take one ton of coke to a ton of pig; then take three tons of ironstone to one ton of pig, and we have the following result:—

Royalty on Coal.

		s. d.
2 tons Slack = 1 ton Coke	2 at $7\frac{1}{2}$ d.	= 1 3
Wayleave	2 at 2d.	= 0 4
3 tons of Ironstone = 1 ton Pig	3 at 6d.	= 1 6
Wayleave	3 at 2d.	= 6
Manufactured Iron—2 tons of Coal	9 $\frac{1}{2}$ d.	= 1 7
	Total	5 2

This does not include royalty on limestone. In Belgium these

royalties do not exceed 5 per cent. on the profits, and in Germany, with which we are concerned, 2 per cent on the output, which gives us the following comparison :—

	Great Britain.	France.	Germany.
Pig iron . .	4s. 6d.	8d.	6d.
Ship plates . .	5s. 9d.	1s. 3½d.	1s. 0d.
Steel rails . .	5s. 6d.	11d.	8½d.

So that in reference to royalties Great Britain has to bear burdens as follows :—

4s. per ton on pig iron,	{	over those of <i>Germany</i> , and
4s. 9d. per ton on ship plates, and		
4s. 9½d. per ton on steel rails,		
3s. 10d. per ton on pig iron,	{	over those of <i>France</i> .
4s. 5½d. per ton on ship plates, and		
4s. 7d. per ton on steel rails,		

We have, however, to compete with these nations in the markets of the world. How this serious disadvantage has to be met, I must leave to wiser heads than my own, but undoubtedly something must be done.

The fourth cause is what I might perhaps describe as a want of adaptability on the part of our own producers themselves. Our manufacturing and commercial superiority seems to have spoiled us. We were so long the workshop of the world that I fear we arrived at the complacent idea that people abroad must take what *we* thought best for their purpose, while the manufacturers of other nations, in their desire to develop the resources of their own country, sought to supply what was required or fancied by their likely customers.

I had a very striking example of this in a recent visit to Canada. Amongst other places, I visited with a friend a small factory for making steel axes, &c. I said to the proprietor, “ You cannot possibly have made all these axes ? ” “ No,” he replied ; “ we import the bulk.” “ Where do you get them ? ” “ Some from Sheffield, but chiefly from Germany.” “ How is it,” I said, “ that you, a good Scotchman, do not patronise your own country ? ” “ Well,” said he, “ I’ll tell you. I wanted

some axes for our woodcutters and lumbermen. I sent sample orders to a house in England and to one in Germany, and ordered a small quantity from each. The English house replied that the shape was not quite to their pattern, and that they were sending out the articles of their own pattern, as they were superior and would serve the purpose much better. The Germans also replied that the patterns were different from theirs, but that they would make some alterations in their tools, and send the axes as required, which they did. What was the result?" continued he. "It was this: when the buyers came, they took the pattern they wanted, and in reply to my advice that the others were better, said, "Perhaps so, but we prefer these," and the consequence has been that I have sent several repeat orders to Germany, whilst some of the first order of the English maker are still on my hands." This is no solitary instance. I met, whilst in Germany, the partner of an English hardware firm who had been taking it easy, as it is called; but whilst he was shooting and hunting, his business had been dying—a not unusual experience. Well, he said he found customer after customer who had left him, and ordered goods from Germany, from precisely the same cause, and he was most anxious to get home in order to apply the remedy.

Now, gentlemen, "As the old cock crows, the young one learns." The evil does not stop here, but permeates our clerks and *employés*, for the same motive which induces the employer to ask foreigners to adopt his pattern, prevents the clerk acquiring foreign languages for practical use; indeed, there is with us too much of the spirit of the English lady who was admiring the beauties of the Rhine, when a German lady expressed her gratification at the scenery being so admired by foreigners. "Foreigners!" the Englishwoman replied; "we are not foreigners; you are the foreigners; we are English." So I fear that during our commercial and industrial supremacy we said to ourselves, If foreigners want

to do business with us, they must adopt our patterns and must correspond with us in our own language.

The cure for this is obvious. We must adapt ourselves to the requirements of foreign markets, and prepare ourselves to deal with foreign nations in the way that will make success most certain. In the case of my own firm, as many of you are aware, we do a large business abroad, and from the day that I commenced business I decided to carry on trade with foreign nations in their own language, in their own currency, and with their own weights. Naturally, I had at first to get foreign clerks, but I have gradually got Scotch and English clerks trained to a knowledge of those languages, and now they occupy the chief places in the foreign department of my office. Then, again, I think that having these trained men to look after the business, a little more attention ought to be shown to sending representatives about, although this defect seems to be mending.

The last point that I raise is one which suggested itself to me several years ago, and is what I would call the divorce between diplomatists representing this country in foreign nations and the commerce of the nation. Our diplomatists at foreign courts, as a rule, seem to think that their chief and only duty is to follow out political intrigues, and keep themselves in the front of all that is going on in merely *political* matters, utterly disregarding the fact that *commercial* affairs are of equal, and perhaps even greater, importance. To show you what I mean, I may state that some years ago, when the Chinese decided to build warships, the representatives of Germany took care that the authorities at home were made aware of the fact. The representatives of China were received in Berlin with great *éclat*, and were introduced to the celebrated engineering and shipbuilding works "the Vulcan" in Stettin, which, having been already apprised of their intended visit by the authorities, had everything ready for their reception. This establishment, as many of you know, is carried on

under most able and intelligent management. The result was that the ships were at once contracted for, and gave such satisfaction that the Vulcan Works now supply practically all the Chinese war vessels.

Now, I may be wrong; but, so far as I know, our representatives never sent any such communication to our Foreign Office as to the intention of the Chinese Government, and if they did, I should be very much surprised to hear that our Foreign Office had prepared any of our home shipbuilders for their visit. Therefore, I think it incumbent upon every one connected with the iron and steel industries to see that this divorce ceases, and that the commercial reports, which of late years our Consuls and diplomatic agents have been instructed to send more fully and quickly, shall not be the hard and dry mummy of mere facts, but rather a sympathetic union of commerce and diplomacy, where the diplomatic position will be employed quite as much in the interests of our commercial prosperity as in furthering our political position.

My friend, Mr. Jeans, our energetic and watchful Secretary, to whom before I close I must express my extreme indebtedness for some of the suggestions and most of the figures in this address, points out that the success of our German competitors may partly be traced to the greater support which they accord to their trade organisations, and to the larger and more diversified amount of work that these organisations are thus enabled to perform. The German Iron Trade Association, corresponding to our own, has nearly 400 members, and a total annual income of over £3000; whereas this Association has only about 160 members, and an annual income of less than £500.

There is no doubt that there is a great deal of importance to be attached to this question, and I feel that the services that our Association renders at present are necessarily limited as compared with what it could do if every firm connected with the iron and steel industries were represented in it. It

is to be hoped, therefore, that each member of this Association will do his utmost to bring about this desired result.

I fear I may seem to have taken too pessimistic a view of the position. I need not say, gentlemen, it was not my intention to foster anything like feelings of discouragement as to our future, much less feelings of despair, but merely to inquire what defects there might be in our commercial and industrial system with the object of having them removed, and with this end in view I feel I cannot conclude more appropriately than in the eloquent words of that most thoughtful and cultured American, Ralph Waldo Emerson :—

“ I feel in regard to this aged England, with the possessions, honours, and trophies, and also with the infirmities of a thousand years gathering around her, irretrievably committed as she now is to many old customs which cannot be suddenly changed, pressed upon by the transitions of trade, and new and all incalculable modes, fabrics, arts, machines, and competing populations, I see her not dispirited—not weak—but well remembering that she has seen dark days before; indeed, with a kind of instinct that she sees a little better on a cloudy day, and that in storm of battle and calamity she has a secret vigour and a pulse like a cannon. I see her in her old age, not decrepit, but young and still daring to believe in her power of endurance and expansion, with strength still equal to the time, still wise to entertain and swift to execute the policy which the mind and heart of mankind requires in the present hour.”

So may it be in the matter we have been considering, and it will be strange indeed if among the captains of our great trades and industries there be not found heads wise to discern and hands swift to apply the remedies to any defects in our system, and to adopt a plan and a policy which will recover and maintain for us our former commercial and industrial progress and pre-eminence.

DISCUSSION.

The PRESIDENT said they were greatly obliged to Mr. Jacks for his very able and interesting paper. They would most of them be in accord with the opinions he had expressed, especially with his strictures on our methods of business, for to those who were more enterprising than others, they had long been looked upon as weak points in British commerce. Great Britain had only just learnt with great astonishment that it was possible for other nations to make and sell things. When that was learnt thoroughly, depend upon it British pluck and energy would be able to devise such means as would still keep Great Britain in the forefront of the trading nations of the world. (Hear, hear.) Of course, in comparison with the nation so ably represented by his friend Mr. Carnegie, Great Britain was a good deal handicapped by having her manufacturing and trading still smeared with those old feudal institutions which we had not yet thoroughly got rid of, and which had been referred to more pointedly by Mr. Jacks when he mentioned the extraordinary amount of the royalties on manufactured iron as compared with those of any other nation in the world. He hoped that sooner or later they would be able to deal with the difficulty of royalties, which to his mind was one of the most serious questions that they would have to face in the time to come, and in the adjustment of the profits of trading which must naturally be shared between the owner, the capitalist, and the labourer, he thought they would perhaps have to ask their friends who owned royalties to take less money, or else they would be obliged by legislation to set their house in order for them. However, that was a very large and a very vexed question.

Mr. FRANCIS BOLLING (Messrs. Bolling & Lowe) said he had

often felt that in this country we possessed for many years the most skilled workmen required for the skilled trades; but when the steel trade came in things became very much changed. There was more facility for turning the raw material into steel by chemical processes. In his lifetime he had seen that after great wars great energies were developed. In countries like Germany and France they had a certain reserve of raw material, but they did not have the wealth, the pluck, the courage, to go into speculation and open coal mines and iron works. The war that ended about 1871 seemed to encourage them to take that up. In America, after the war between the North and South, there was a development year by year. He did not despair of the English iron trade, only we hesitated to adapt ourselves to circumstances. As to the United States, with all due respect to what Mr. McCormick and Mr. Carnegie had said, he did not believe that the British iron trade would have much to get from them, except in regard to the export of tin plates. The States were now getting the command of more and more skilled labour for their steel works. Even to-day, if they were to take the duty away, how much steel would they export to the United States? They would not get a single order. Was that not so? It seemed to him that, having regard to the increase of population which took place in every nation, this country had not advanced in production in the iron and steel trades in the same proportion as the United States, France, or Germany. That showed that Great Britain had been resting on her oars, and she would have to make up for it the best way she could. It was the manufacturer's business to give the merchant a cheap production, with which he could go into the markets of the world and fight our rivals. But when a man says, "My dear fellow, I never had that pattern before; it is really too much. Cannot you secure me a large order in this style?" of course the merchants had to talk him over or else to say, "We are very sorry, but we shall have to make the offer to a foreigner." The facilities for shipment had now increased to a very great extent, and

in consequence of that fact, Hamburg and Havre had facilities for exporting large quantities of goods at moderate freights, which we had not here. In England the centres of industry were not well situated for men who were engaged in exporting. If they went to South Wales—Cardiff, Swansea, and those places—they could not get up a general cargo at any of those places. They would have to go to Liverpool and stick on an extra freight. Those points were very much against the British merchant. If a vessel went to Cardiff, for instance, she would not get a general cargo. She would have to take a cargo of coal. But if she went to Antwerp, Hamburg, or Havre, she would be able to take a mixed cargo, and would, therefore, be able to go cheaper. As a rule, they could ship from foreign ports which exported iron—such as Antwerp, Hamburg, or Havre—at 2s. 6d., or 3s. to 5s. per ton cheaper than was possible in an English port.

The PRESIDENT said they might now call upon their friend Mr. Jeans to read a paper which he had prepared, and which was certainly one of the most interesting documents of its kind that he had ever looked over. It was a paper on the laws regulating the liability of employers for accidents to workmen in different countries in their bearing on English law and usage. Mr. Jeans presented that paper, not in his official position as secretary, but as a member of the Association.

He must say as a politician, but not as a party politician, that they were laid under very great obligation to Mr. Jeans for preparing this paper on a subject which was undoubtedly of the very first importance, socially, at the present moment. It was absolutely free from all controversy, as they would find, but it brought before them a complete statistical compendium of the laws of different countries regulating the liability of employers for accidents to workmen.

ON THE LAWS REGULATING THE LIABILITY OF EMPLOYERS FOR ACCIDENTS TO WORKMEN IN DIFFERENT COUNTRIES, IN THEIR BEARING ON ENGLISH LAW AND USAGE.

BY J. STEPHEN JEANS.

THE question of the civil liability of employers for accidents occurring to their workmen is one of the most important, from a social and industrial point of view, that has come to the front for a long time. It is, moreover, one that is still pending, not alone in our own country, but in nearly every other that has any considerable claim to an industrial status. Germany, Austria, France, Italy, and Belgium have all, within the last few years, taken action with a view to placing this question on a more satisfactory and equitable basis, although they have not all proceeded on the same lines. In most of the principal countries of Continental Europe, as in our own, there has been a disposition to leave a good deal to the voluntary action of employers and employed, as manifested through insurance funds and otherwise. In Germany, on the contrary, the State has not only stepped in, and insisted on the liability of employers, but it has also laid down, by express enactments, the exact lines on which the employer shall proceed to act with a view to meeting his responsibility; and has declared, in effect, that it shall be met so, and not otherwise. There is, therefore, a considerable amount of diversity, both of theory and practice, in reference to the *modus operandi* of meeting this serious class of liabilities.

No apology need be offered for bringing this subject before a meeting of the British Iron Trade Association. Britain is still by far the most important industrial nation in the world. Accord-

ing to the latest Census returns available, there were in England and Wales 24·5 per cent. of the whole population engaged in industrial or manufacturing employments, as compared with 12 per cent. in France, 13 per cent. in Prussia, 10 per cent. in Austria, 17·2 per cent. in Belgium, and only 7·6 per cent. in the United States.* And not only is our industrial class the most important numerically, but it is increasing in its relative importance, for in the twenty years ending 1881 it had grown from 22·7 per cent. to 24·5 per cent. of the whole.

It is not difficult to prove that both relatively and absolutely the iron and steel and allied industries are the most important in the whole category of industrial occupations, at any rate so far as the United Kingdom is concerned. Table A in the Appendix shows that in 1881 there were close on 800,000 hands employed in the various branches of the iron and steel industry, including those who followed engineering, shipbuilding, the tin plate manufacture, and cutlery. If to this figure we add the numbers employed in the coal industry, of which the iron manufacture in its various branches is the principal customer, we have a grand total of about 1,410,000 employés, which is within 33,000 of the aggregate number returned as engaged in the agricultural industry of England as a whole in 1881, and which exceeds by over 320,000 the total numbers employed in our large textile industries in the same year. At the lowest computation, this vast industrial population will probably earn an average of fully £60 a year,† which would make their total annual earnings not less than eighty-four millions sterling.

Apart, however, from the absolute and relative numerical importance of the iron, steel, and allied industries, there is

* These figures are likely to be modified, and perhaps considerably, by later Census returns, but the industrial distribution of population under the Census of 1890 is not yet declared.

† The Board of Trade Report on the wages paid in mining industry in the United Kingdom, in 1886, gave an average of about 25s. for the coal miners, and an average of rather less than that sum for the iron ore miners employed in that year, but since then the average wages have considerably increased.

another aspect in which they unfortunately hold an exceptional position. They are, taken as a whole, and including the mining industries, among the most dangerous of occupations, and consequently among the most liable to accidents affecting life and limb, so that they have a very special interest in the question that we have now met to consider. During the thirty years' interval which separates 1861 from 1890 there were 31,446 fatal accidents reported in our coal mines alone, due to the following general causes:—

Explosions	6618
Falls of coal and roof	12,848
Accidents in shafts	3632
Miscellaneous accidents underground	5829
Surface accidents	2514

This appears on the face of it to be a serious record, and so no doubt it is. But it is one that has been steadily improving from period to period, and almost from year to year, as will be seen on referring to Appendix B. The chief source of accident, it will be noticed, is the least of all preventible by legislative or other measures, namely, the falls of coal and roof. The accidents from this cause are about twice as numerous as those from explosions, almost four times as numerous as the accidents in shafts, and fully five times as great as the accidents on the surface. And it would appear, moreover, as if there was not the same steady amelioration in these as appears in other sources of accidents, which the precautions taken by coal-owners, and the provisions of the Mine Acts of 1872 and 1887, have done so much to mitigate. Looking over the history of coal-mining in this country, it appears that such accidents were as great a source of trouble when collieries were of small dimensions and insignificant depth as in later years, but they have not perhaps been the subject of so much public interest and sympathy, because they destroy, not in battalions, but in "single files." The Report of the South Shields Committee of 1839 states that out of 349 violent deaths in coal mines in the

previous year reported by the Registrar-General, 97 were due to falls of stones and coals, and 43 to various injuries in the mines, as compared with 88 due to explosions of gas; but the committee found, while all that skill and capital could do to "render the place of work inoppressive, healthy, and safe, is often done," it was not practicable to render them quite safe by any means then known. The same remark has to be made to-day, after an interval of more than half-a-century. The Mines Acts have a number of provisions intended to minimise the accidents from this source, the most important (rule 16 of 1872, and rule 21 of 1887) requiring that the roof and sides of every travelling road and working place shall be made secure, and providing (rule 22 of 1887) that suitable timber shall be provided for timbering the roof, and that the distance between the sprags or holing props, where they are required, shall not exceed six feet. Another important provision (rule 4 of 1887) requires the roof and the sides of working places to be examined before the men commence work. But when these two or three simple rules have been observed, all has been done that can apparently be done to secure the workmen from the serious liability to entombment in a mass of fallen stone or coal, which comes upon him generally with little or no warning. This is perhaps the most heartless part of the whole business of mining. The total number of men killed during the last thirty years from falls of coal and roof was 12,848, the proportions of that total for each decennial period being as under:—

Period.	Periodic Average.	Annual Average.
1861-70	4164	416
1871-80	4272	427
1881-90	4412	441

It would appear that there has been an absolute increase of deaths from period to period, which fact, taken by itself, would make it seem as if all the advances of science, all the

improvements introduced as the result of practical experience, and all the enactments required by the legislature, had failed to achieve any substantial good. When, however, we examine the figures in relation to the quantities of coal produced, there has been a considerable amelioration over this period; thus:—

Period.	Annual Average Production of Coal.	Tons produced per Fatal Accident from Falls, &c.
1861-70	Tons. 103,330,000	248,300
1871-80	131,016,000	307,000
1881-90	164,178,000	372,000

It is gratifying to observe that there is a similar tendency to a reduction of other underground accidents, the periodic and annual averages having been as under since 1861:—

Period.	Periodic Average.	Annual Average.	Tons raised per Fatal Accident.
1861-70	1916	191·6	539,000
1871-80	1747	147·7	745,000
1881-90	2126	216·6	772,000

It would be useful if we had statistics at command that would show the numbers of accidents in the iron and steel industries, as such, relatively to a similar standard for a period of equal length, but this information is not at command. Obviously, so far as the above figures go, they prove that the liability of employers is not so serious a charge upon their resources now, as it would have been under the Act of 1880, at an earlier period in the history of the coal industry; and it may be presumed that this fact will equally apply to other industrial operations. It may be added that, on the Continent of Europe, the safety of industrial employments, and especially of mining, has been greatly promoted during the last thirty or forty years by improvements in the methods and appliances adopted, and by legislative demands similar to our own, although

it is not by any means certain that the Continent can show so good a record as the British Isles.*

II.—FORMER LAWS AND REMEDIES.

United Kingdom.—Until the Act of 1880 came into operation, the only remedy that a workman had against his employer for an accident that happened to him in the course of his employment, even if caused directly by the negligence or fault of the employer, was an action at common law. Such accidents were frequent enough, but it was felt that the cost of legal proceedings had a deterrent effect on workmen, and that probably careless employers frequently escaped the penalty that was due to their oversight or neglect, hence the Employers' Liability Act of 1880.

United States.—The common law generally provides that common employment relieves the employer from responsibility for the injuries which one employé may receive through the negligence of a co-employé, unless negligence can be shown in the employment of unfit agents. The common law makes the employer liable also when he has directly interfered in the act which caused the injury. Except where special legislative restriction exists he is not otherwise liable, unless under special contract.

Germany.—Until 1884, the liability of employers to compensate workmen injured in their service was regulated by the law of the 7th June 1871, which entitled any workman who might be injured in industrial or railway employment, to compensation from the employer, provided he could prove that the

* A recent report of “*l'Union des Charbonnages, Mines, et usines Métallurgiques*,” of Belgium, gives the following averages:—

Numbers of Workmen killed per 10,000 Employed.

Years.	France.	Great Britain.	Belgium.	Prussia.
1851-60 . .	34.04	40.61	29.32	20.54
1861-70 . .	29.61	33.29	26.05	28.64
1871-80 . .	22.19	23.54	24.50	28.96
1881-90 . .	18.53	19.36	19.92	29.34

injury had been caused by the negligence of the employer, or of a person in authority employed by him. This law (the "Haftpflichtgesetz") was practically superseded by the "Unfallversicherungsgesetz" of the 6th July 1884, which will be again referred to.

France.—The common law still continues to regulate the liability of employers in France, although many different special laws have been proposed and discussed during recent years. The chief provisions of the common law dealing with this matter are Articles 1382 and 1383 of the Civil Code. The first provides that any person whose act causes an injury to another is bound to repair it ; and the second, that every one is responsible for any injury caused by his act, and by his negligence and imprudence ; while a third provision makes a person responsible for the acts of persons for whom he is answerable, employers being thus answerable for injuries caused by their servants and overseers, in the performance of duties entrusted to their charge.

Austria.—Until 1886 the liability of employers to compensate workmen injured in their service was regulated by the ordinary civil law, which provides that they were responsible only when they had been the direct cause of such accidents. The employer was not responsible for the acts or omissions of any person employed by him, whether in authority or not, unless he could be proved to have selected an incompetent agent, or to have retained such agent in his service after his incompetency had been proved. Under the law of the 11th June 1883 Austria was divided into districts for the purposes of factory inspection, and the inspectors were required to see that employers adopted proper precautions for the protection of their employés.

Italy.—Until the year 1886 the common law alone regulated the liability of employers for accidents. Between 1883 and 1886 there was a great deal of discussion, both in the Chamber of Deputies and in the Senate, on the special legislation originally proposed in February of the former year. This law will be again referred to.

Belgium.—The responsibility of employers is regulated in Belgium by the Civil Code (Articles 1147, 1148, 1382, 1383, and 1384), which practically enacts the same provisions as those above named under the head of France. In the event of a workman being injured, he is not required to give any special notice of the facts or of his claim to his employer. Employers and workmen are not allowed to contract themselves out of the provisions of the Civil Code. In each separate case the tribunal has to decide what difference, if any, is to be made in the result by the fact that the accident was caused by a fellow-workman.

III.—VOLUNTARY ORGANISATIONS FOR MEETING ACCIDENTS TO WORKMEN.

Belgium.—In Belgium the relations of employers and employed appears to have been more than usually harmonious in consequence of the useful work done by the general provident societies (“*Caisses Communes de Prévoyance*”), which, founded about fifty-five years ago, grant life pensions to miners incapacitated from work in consequence of accidents, and, in the event of their death, to their widows and orphans. There are also private friendly societies (“*Caisses particulières de Secours Mutuels*”) attached to each separate mining establishment, which grant temporary assistance to sick or injured workmen. Many employers subscribe to these societies, but they do not thereby in any way diminish their responsibility for workmen injured in their service.

General provident societies are established in each of the six principal mining divisions of the country. These societies derive their funds from five different sources, namely:—

1. Drawbacks or deductions from the wages paid.
2. Subscriptions from employers.
3. Contributions from the province.
4. Contributions from the State.
5. Donations and legacies.

From the date of their establishment until the year 1889—a period of about fifty years—these six societies have expended a total sum of $51\frac{1}{2}$ millions of francs (£2,062,000), of which sum $31\frac{1}{2}$ million francs, or £1,220,000, was provided by the employers, by the State, by the provinces, or by donations, and the remainder of £842,000 by the workmen. There are 162 collieries, &c., and about 100,000 workmen connected with the societies.*

These societies are controlled by commissions, presided over by the governor of the province, and composed otherwise of proprietors of mines, managers or engineers of mines, and principal workmen (*maitres-ouvriers*). The commissions are worked very cheaply—so much so, that in 1890 the working expenditure only amounted to 42,502 francs, or about 2 per cent. of the total outlay on pensions, &c., which amounted to 2,022,687 francs. For the province of Liége alone, the administrative expenditure did not exceed 1.5 per cent. of the pension and relief expenditure. The Belgian coal-owners take a justifiable pride in comparing this expenditure with that incurred in Germany, where the total outlay on indemnities and pensions in 1889 was 12,278,000 marks (£613,900), and the working expenditure was not less than 4,639,000 marks (£231,950), being almost a third of the total. The coal trade of Belgium has recently been urging on the Government that instead of introducing a new special law, or system of laws, dealing with employers' liability—which would probably have the effect of superseding the general provident societies above referred to—the basis of these societies should be widened, and other industries should be required to establish provident funds worked in the same effectual and inexpensive way.

France.—There are two organisations established in France for the purpose of dealing with accidents to workmen, the first known as the *Syndicale d'assurance mutuelle*, and the other as

* The proportions of the total income received from each separate source during the eleven years ending 1891 are given in a recent report.

Syndicats professionnels. The *syndicales* are strictly societies for mutual insurance, and are subject to the law of the 22nd January 1868. The legal *régime* under which these societies are placed has been said to offer to all the interests concerned in their administration a guarantee that they are well looked after. The actuaries for this *Société* have calculated with the utmost nicety the amount of expenditure to be provided for each class of accidents liable to occur in each category of factories or works, and, consequently, the annual payment necessary to be made by each member of the society, in order to meet the expenses of carrying it on. The amount of subscription to be paid is fixed each year by the Board of Management, according to the ascertained requirements of the organisation, and is payable in advance. The money so subscribed is allocated to two different funds—the first called the *fonds de prévoyance*; the second, known as the *fonds de garantie*. The subscriptions are thus devoted, in the first place, to meeting the current expenses of the fund, and, in the next place, to establish a reserve sufficient to secure for the victims of accidents, or for those dependent upon them, the payment or pension provided for.

The French system of “*Caisses syndicales d'assurance contre les accidents*” has been in operation more or less for many years. In the building trade, such an institution has been in operation since 1859, and, according to details recently furnished by M. Léturgeon, the President of the Chamber Syndicale, it appears that the members connected with the *Société* employ over 7000 workmen in the department of the Seine, who annually earn a sum of twelve million francs as wages—about £480,000. The indemnities distributed among these workmen average about 100,000 francs, or £4000 per annum, and the cost of working the system, including clerical assistance, medicine, judicial expenditure, &c., does not exceed 10,000 francs, or £400, per annum. The expenses are met by an annual levy of 1 franc 25 centimes on the wages paid.

The same system has been attempted on a larger scale in the French iron trade within the last twelve months. The President of the *Comité des Forges de France*—a society that corresponds in character to the British Iron Trade Association—assisted by M. le Baron de Nervo and other gentlemen interested, has drawn up a code of rules for the *Caisse d'Assurance Mutuelle des Forges de France* (the office for the mutual insurance of the persons engaged in the French iron trade). The members of this institution represent and employ about 40,000 workmen of all ranks, whose annual earnings exceed fifty millions of francs (£2,000,000). A number of employers have not yet given in their adhesion to the new insurance organisation, partly because they are under obligations to offices or corporations which, like the Employers' Liability Insurance Corporation, undertake to relieve employers from financial liability on payment of certain premiums, and partly for personal reasons. It is, however, understood that before long the special organisation constituted to deal with accidents in the French iron trade will have the support of the members of that industry generally.

Manifestly, the organisation of a perfect system of insurance against accidents should provide for their prevention as far as that may be possible, as well as for their reparation, and in the German system this idea is kept prominently in view. The corporations have there the right to determine what regulations and provisions shall be made with a view to the prevention of accidents, and they employ a regular service, and incur annually a heavy outlay, for that purpose. They nominate inspectors, who have free access at all times to works and factories, and who are charged with the duty of seeing that the regulations imposed for the prevention of accidents are duly carried out. In case of failure to carry out the requirements of the corporation and their inspectors, the offender may be called upon to pay twice the regular amount of his subscription.

The more free and voluntary *caisses syndicales* of France are

not invested, like the great corporations of Germany, with the power of making rules and enforcing their execution, but they can and do obtain the same results by means of special clauses inserted in their policies of insurance. In the rules and regulations adopted by the iron trade *syndicale*, it is provided that each member of the organisation is under an obligation to allow the inspectors appointed by the administration for that purpose to examine the condition of the machinery and appliances generally in each establishment, as well as the arrangements made with a view to the prevention of accidents; and those ironmasters or heads of establishments, who decline to make such alterations as are deemed by the inspector to be required to secure adequate immunity from accidents, are subjected to an enhanced rate of premium or payment, varied, up to an addition of 25 per cent. on the rate ordinarily paid, according to the estimate made of the greater risk incurred. On the other hand, a reduction on the average or ordinary rate of premium paid may be accorded to an establishment in which accidents are avoided by reason of the special care taken to keep the machinery and plant in good order, and thus far contribute to their avoidance.

United Kingdom.—For many years there have existed in the counties of Durham and Northumberland, and in other parts of the country, organisations intended to provide for accidents to workmen on the mutual principle. The more important of these will be again referred to.

IV.—RECENT CONTINENTAL LEGISLATION.

Germany.—The “Unfallversicherungs-Gesetz,” or law of insurance against accidents in Germany, is the most drastic and complete system of its kind hitherto established in any country, and has been spoken of as the highest practical development of State socialism hitherto attempted. The law imposes on the employer, the obligation (*a*) to compensate workmen injured in

his service ; (b) to pay a pension to the widows of workmen killed in his service ; and (c) to maintain the children of workmen so killed until they have reached a specified age.

In view of meeting the requirements of the law, employers have, for their own protection, and with a view to spread their risks over as large an area as possible, grouped themselves into 64 trade associations or corporations, which, at the end of 1890, comprised about five millions of workmen, of whom 583,000, or 11 per cent., were connected with the iron and steel industries.

Altogether there are eight corporations established in the iron and steel industries of Germany, namely :—

1. For the south.
2. „ „ south-west.
3. „ Rhineland and Westphalia.
4. „ the Engineering trades of Westphalia.
5. „ Saxony and Thuringia.
6. „ the north-east of Germany.
7. „ Silesia.
8. „ the north-west of Germany.

When a workman is injured, the whole of the employers who belong to the above eight corporations are under legal obligations to pay him compensation for the injury received, and out of the total number of eight "Berufsgenossenschaften" formed for this particular trade, those employers are liable who form that association in whose district the works of the employer concerned is situated.

The funds for compensating injured workmen, and the costs of administration, are raised yearly from all the employers within the respective districts, in proportion to the wages paid by each employer to his workmen within the year.

The above law was extended, by the law of 28th May 1885, to all workmen employed in the post, telegraph, and railway services ; to industries carried on by the administration of the army and navy ; and to inland navigation, to the working of dredges, ferries, and rafts, to the transport of passengers and

forwarding of goods, to the loading, unloading, and warehousing of goods, to cellarage, and the like.

Firstly. The liability of employers extends to all workmen employed in manufactories, mines, quarries, forges, wharves, and in the building trade.

Secondly. All workmen employed as masons, carpenters, tilers, stone-cutters, chimney-sweeps, or engaged in well-digging and pump-making.

Thirdly. All workmen employed in industries employing boilers or machines driven by elementary power (wind, water, steam, gas, hot air, &c.).

Fourthly. All persons employed in the industries or trades above mentioned who are not workmen, properly so called, but employés receiving a fixed salary not exceeding 2000 marks per annum.

All persons included under these four headings are entitled to compensation when injured at their work, or, in other words, they are insured by law (*ipso jure*) against accidents suffered at their work ("Betriebsunfälle").

Only such persons as are employed in offices as clerks, book-keepers, and the like, and who, consequently, have nothing to do with direct industrial work, are exempted from this law.*

The only cases in which the employers can be relieved from liability are—*1st.* When the injury suffered by the workman has no connection at all with the execution of his duty in his practical work, as for instance when a workman is injured by a fellow-workman in a quarrel; or, *2ndly;* where a workman is convicted of wilfully injuring himself, or of wilfully causing

* Officials appointed by the Government (of Germany or of a German State), or by a public community, who receive a fixed salary, and are entitled to a pension from the Government or from a municipality or other public community, are not affected by this law. Such officials, as far as they are employed in a trade or manufactury ("Betrieb") affected by the "Accidents Insurance Law," are entitled to a pension from the Government when they become unfit for service by an accident suffered in such employment according to the provisions of the "Gesetz betreffend die Fürsorge für Beamte und Personen des Soldatenstandes infolge von Betriebsunfällen," or law to provide for officials and persons in the military service in case of accidents (15th March 1886).

the accident by which he has been injured, and thereby loses all claim for himself or for his family for compensation.

It makes no difference whether a fellow-workman is in authority over an injured workman or not; but, should the accident have been caused by gross and criminal neglect on the part of the employer or of one of his working managers, and should this opinion be confirmed by the verdict of a criminal court, then the compensation is also paid out of the funds of the local association, but the incriminated employer or manager, as the case may be, is bound by law to repay to the "Berufsgenossenschaft" the amount disbursed for the workman injured. Even in this case, therefore, the workman has no direct claim against his employer.

As far as responsibility is concerned, there is no difference between the liability of employers for the condition of machinery, plant, and permanent appliances used in productive industry, and his liability for specific acts or defaults of his workmen.

The employers are obliged by law to settle the claims of an injured workman without a special notice being given by the workman injured. If for any reason the employers have omitted to settle such claim, the workman injured is bound to give notice of his claim within two years of the time of receiving his injury, otherwise he would (with some exceptions) lose his claim.

Employers individually, and as Trade Associations ("Berufsgenossenschaften"), are positively forbidden by law to restrict by contract or otherwise the rights and claims given by the law to their workmen. All stipulations of such a kind would be null and void.

The right to compensation is not treated as arising out of the contract between employers and employed, but rather as a right of a public character, arising out of a natural obligation of the employer to compensate workmen injured in his service.

The liability of the employer begins from the fourteenth week after the accident. For the first thirteen weeks the in-

jured workman is supported by the funds of the "Krankenkassen" (sick funds).

According to the "Krankenversicherungsgesetz" (15th June 1885), contributions to sick funds are compulsory. To these funds the employer contributes in the proportion of *one-third*, the workman of *two-thirds*.

The employed do not contribute in any way or manner, either voluntarily or otherwise, to the funds out of which their *insurance against accidents* ("Unfallversicherung") is paid, and therefore in no way to the benefit conferred upon them by the law, except in so far as they are bound by law to contribute to the sick funds, which support them for a period of thirteen weeks after the accident has happened.

There is a distinction made in the law of Germany between accidents that are of a comparatively trifling and those that are of a serious character. Some authorities have maintained that it is not advisable to charge to the accident fund accidents which only entail a partial incapacity of short duration. The same distinction that exists in Germany was originally made in the law submitted to the French Chamber, but that provision was modified in the course of the discussion, and employers were ultimately relieved from the obligation of paying to the victims of an accident the expenses of their illness and the temporary compensation during the three first months, and these expenses are supposed to be met, as in this country, by the friendly societies, whose function the insurance corporations should not in any way usurp.

Besides the tax levied on the employers of labour in Germany in respect of accidents to workmen, a further contribution of considerable amount is called for to meet the expenses of the law for insurance of the working classes against old age and infirmity. The State, the employer, and the workman bear equal shares in the raising of this fund, each contributing towards the total estimated expenditure of £7,800,000, a proportionate sum of £2,600,000, which in the case of employers

and workmen is calculated as equal to a fraction over one penny per week. The assessment is at the rate of six shillings for 300 working days in the year per workman employed, and the workman's contribution has to be deducted from the wages paid on each pay-day.*

The organisation for the insurance of workmen against accidents has been established in Germany under the form of a corporation, and in Austria under the form of a province or locality. Each system has its advantages. In Germany, indeed, the corporations are established in view of both geographical and industrial conditions. The German system has been approved by some economists in France, where it was recently argued that it permitted of the association of a considerable number of workmen in the same industry, and subject to the same chances of accidents, arriving at a correct average of risks, and thereby being able to fix the contributions required with absolute precision.

In a paper recently read before the *Société d'Economie sociale et des unions de la paix sociale*, on the *syndicale* offices for mutual assurance against accidents, M. Albert Gigot observed of the German system that "one is struck with the vices of a system that substitutes for the action of private initiative, the environing and absorbing power of the State; and, on the other hand, the most pronounced opponents of that system cannot avoid a sentiment of admiration for the perfection of the mechanism which has created and set to work the legislation of Germany on the subject of accidents to workmen, and we are led thereby to inquire whether it would not be possible to create, under the forms and the *régime* of liberty, something analogous to these mutual corporations which are in operation on the other side of the Rhine, under the guidance and the authority of the imperial assurance office."

* It is the aim of this fund to allow to each workman on attaining the age of seventy years, or being disabled at an earlier age by permanent infirmity, an annuity for the rest of his life of £6, women receiving two-thirds of that amount.

Italy.—Numerous attempts have been made to establish in Italy a system of compulsory insurance against accidents. The first important measure was brought forward by M. Berti in February 1883, but the Senate refused to adopt it, after it had passed the Chamber of Deputies.

In February 1890 M. Miceli, the Minister of Commerce, submitted a *projet* intended to secure compulsory insurance. A new Government was, however, directly afterwards called to power, and in April 1891 the subject was reintroduced. The proposed new law specifies that from the fifteenth day of incapacity from work, the workman shall be entitled to relief, to be afforded either by the State insurance office, or by the societies or individuals concerned. The amounts of the allowances or indemnities are not fixed. This it is proposed to remit to the *Caisse Nationale* (State Office), who will determine the sum due, having regard to the amount of wages earned by the workman, and the seriousness of the injuries sustained. By providing voluntary insurance funds, the parties concerned may be relieved from the charges proposed under the law.

Denmark.—In this country, recent legislation has proposed compulsory insurance by the State, which has created a special bureau for carrying out its provisions. The employers and employed intervene only in the constitution of the *tribunal arbitral*, which deals in the last resort with disputed cases. The workmen are dealt with under the three categories of industrial, agricultural, and maritime. In case of accident or death, an indemnity is paid, which is fixed in each particular case by the insurance bureau, and the amount of which is varied according to the amount of the workman's earnings, and the extent of his injuries and incapacity. The compensation to be paid cannot, however, in any case, exceed two-thirds of his earnings. In case of the death of the workman, the insurance bureau pays the funeral expenses; the widow receives an allowance equal to 14 per cent. of the earnings of the deceased, the children 7 per cent. of their father's earnings up to the age of

fifteen, but the total sum to be paid to the family must not exceed 35 per cent. of the total annual earnings of the worker. In its essential details, the Danish system is a reproduction of that of Germany.

Russia.—Under the Russian law of 1861 (art. 60), any workman who was injured in the course of following his employment had a right to compensation to the extent of double the wages agreed to be paid for the duration of the contract made with his employer, and in the case of his death (art. 61), his family had a right to the same compensation, besides funeral expenses.

In 1881, the Council of Commerce and of Manufactures was instructed to draft a law as to the responsibility of employers towards their workmen, and in 1889 it submitted to the General Council of the Empire a scheme which recognised the liability of employers, but required that proof of the accident having been due to the default of the employer should be furnished by the workman, or his representative, who made the claim. When this has been done, the employer is required, in case of total incapacity, to pay an indemnity equal to the amount of the workman's wages; and in case of partial incapacity, a pension or allowance, varying according to the extent of the workman's incapacity. In the case of the workman's death, the widow is to receive a pension equal to 30 per cent. of the wages of the deceased, and each child up to the age of fifteen years, 15 per cent. to 20 per cent. according as they have lost both parents or one. The total of these allowances, however, must not exceed 60 per cent. of the average annual wages of the deceased. The right to the revision of the pensions or indemnities is accorded for a period of two years after they have been fixed.

Spain.—On the second day of May 1891, the Spanish Government adopted a law as to industrial accidents, which is based on three different classes of responsibility--namely, that of the employer, that of the employé, and that inherent in the character of the employment, or what is called professional risk. Dis-

tinctions are made between permanent and temporary cases of incapacity. In the latter case the workman has a right to the amount of his earnings at the time of his accident during the period of his incapacity, and to medical attendance and medicine. In the case of partial permanent incapacity, he has a right to a payment of from 600 to 1000 pesetas (£24 to £40), and to free medical attendance and medicine. In the event of being permanently incapacitated from all kinds of work, the workman has a right to a payment of 1200 to 2000 pesetas (£48 to £80), and to free medical attendance. Finally, in the event of his being killed, the widow and children under the age of 18 years receive an indemnity of 1200 to 2000 pesetas (£48 to £80), but if there is a widow and no children, she only receives 600 to 1000 pesetas (£24 to £40). If there is neither widow nor children, the next of kin, if upwards of 60 years of age, receive an indemnity of 1000 pesetas.

Sweden.—The Swedish Government appointed in 1886 a Commission to inquire into the question of the insurance of workmen against accidents, which has recommended that in cases of absolute incapacity, 60 per cent. of the amount of the average annual earnings should be paid, and in cases of partial incapacity, an indemnity varying according to the extent of the injury, but not to exceed 50 per cent. In the case of the workman's death from accident, the funeral expenses are to be allowed, and a pension of 20 per cent. to the widow, and of 10 per cent. of his earnings to each of the children. Limits are placed upon the amount of earnings on which these percentages are to be reckoned. The principal industries are divided into five categories, according to the risks which they severally represent. It was proposed that the administration of the system should be undertaken by the State, as in Germany and Denmark. The proposals of the Commission were adopted in effect by the Swedish Government, but the Chamber of Deputies, while recognising the liability of employers, has opposed the idea of creating a State Department to deal with industrial insurance, and the matter is still pending.

V.—THE WORKING OF THE GERMAN SYSTEM, AS APPLIED
TO THE IRON AND STEEL INDUSTRIES.

The opportunity is furnished of studying the effect of the German system, as applied to the iron and steel industries of that country, by a report recently presented to the Reichstag.

The cost of industrial assurance against accidents in Germany has been raised since the system was begun to a total sum of £5,880,000, of which figure metallurgical industry contributed £870,000, or about 15 per cent., showing that the expenditure for that industry is higher than the average, having regard to the number of persons assured. The table that follows shows the principal items of expenditure for the whole of the industrial corporations connected with the fund, on the one hand, and for the metallurgical industry, as such, on the other, from the date of the establishment of the law of assurance against accidents in 1886 to the end of 1890 (1=1000):—

TABLE I.—*Cost of Industrial Assurance in Germany, 1886 to 1889.*

		Total of Industrial Corporations.	Metallurgical Industries.	Proportion of Total Cost in Metallurgical Industry.
Cost of indemnities . . .	£2100	£340	16·9	
Prevention of accidents . . .	68	10	15·11	
Cost of administration . . .	159	75	9·43	
Carried to reserve fund . . .	2765	435	15·73	

This table shows that the cost of administration of the assurance funds for the metallurgical industry has been lower than the average cost of other industries, and that the payment for indemnity and for prevention of accidents, and the sum carried to the reserve fund in respect of that industry, represent respectively 16·90, 15·11, and 15·73 per cent., being, in round figures, about a sixth part of the total expenditure for German industry as a whole, the cost of administration for the iron and steel industries being about 10 per cent. of that of the German industries generally.

The average number of victims of accidents per thousand persons assured during the period under consideration has been **4.28** for all industries, and **5.90** for metallurgical industries.

Prominent attention is called to the fact that there is a growing increase in the number of accidents, relatively, to the total number of persons assured. In the iron and steel industries that increase was even more considerable than in the other industries taken as a whole, as shown in the table which follows:—

TABLE II.—*Fatal Accidents per 1000 Insured.*

Year.	Average Number of Fatal Accidents per 1000 Persons Assured.	
	For all Industries.	For Metallurgical Industries.
1886	2.83	3.64
1887	4.14	5.04
1888	4.35	5.83
1889	4.71	6.71
1890	5.36	7.44

This table not only shows that the average number of fatal accidents per thousand persons assured has more steadily increased, but that it has been all along higher in the metallurgical industries than in other industries, and that the number has increased more rapidly, relatively to the whole number assured.

The following table gives the statistics of the total number of works, the total number of workmen assured, and the total amounts of their earnings for the whole of these districts, eight corporations, representing metallurgical industries:—

TABLE III.—*Number of Works and Workmen, and Total Earnings.*

Year.	Number of Works.	Number of Workmen Assured.	Total Earnings.
1886 . .	10,793	412,007	£17,724,020
1887 . .	20,534	452,505	18,224,516
1888 . .	21,029	493,157	20,397,018
1889 . .	21,848	544,919	23,269,935
1890 . .	22,915	582,823	25,333,356

As regards children under sixteen years of age, or workers who, their apprenticeships not yet being terminated, are not in receipt of regular wages, and have only an annual allowance, the division of the cost of insurance as regards them is 300 times the average daily earnings of an ordinary workman of the locality, as fixed by administrative authority. The average wages show an increase since the year 1887, when the organisation for insurance against accidents may be regarded as complete. For 1887 and the three following years the average wages have been :—

In 1887 . . . £40 0 0	In 1889 . . . £42 12 0
,, 1888 . . . 41 8 0	,, 1890 . . . 43 8 2

The following table shows for each year of the period under consideration the number of fatal accidents occurring previous to the year in question, and pensioned during that same year; the number of workmen who survived accidents during the year, and had received an indemnity in respect of the same; the proportion of the number of accidents for each year per thousand persons assured; and the total number of survivors from accidents who received pensions or whose survivors have been indemnified :—

TABLE IV.—*Statistics of Victims and Survivors.*

Year.	No. of Victims of Accidents which occurred previously, but provided for during the Year.	No. of Victims of Accidents occurring during the Year, and having received Indemnities.	Proportion of No. of Victims during Year per Thousand Workmen Assured.	Total No. of Survivors Pensioned or Indemnified.
1886	19	1,502	3·64	1,521
1887	1,081	2,282	5·04	3,363
1888	2,804	2,877	5·83	5,681
1889	4,798	3,658	6·71	8,456
1890	7,518	4,335	7·44	11,853

The figures in the fourth column of this table show that the number of victims of accidents during each year has been steadily increasing, having advanced from 3·64 per thousand

in 1886 to 7·44 per thousand in 1890, or an increase of more than 100 per cent. for the period of five years considered.

It would appear that the effect of the system of compulsory insurance has been to increase the number of accidents; and this fact is allied to the suggestion that there should be a distinction established between accidents produced by the negligence of the workman and accidents which are solely due to the hazardous character of the employment followed, in the event of any revision of the law of insurance.

The indemnities paid under the German law of insurance to workmen who are the victims of accidents are, in case of partial disablement, medical assistance and medicines from the time the accident occurs to the end of the thirteenth week, and the payment of a further sum from the end of the thirteenth week for the whole of the remainder of the period of incapacity from work. That payment is fixed (a) in the case of being totally incapacitated, and for the duration of that incapacity, at $66\frac{2}{3}$ of the earnings when at work, and (b) in the case of partial incapacity, at a fraction of the total earnings calculated in reference to the extent or character of the injuries received. In case of death the payments made are (1) the relief indicated above up to the date of the workman's decease, and (2) an allocation for the cost of the funeral equal to twenty times the average daily earnings, but not less than 30s.; (3) an allowance to the survivors, to begin from the date of the decease, that income being in fractions of the daily earnings of the deceased as follows:—

For the widow during her life, or until re-married 20 per cent.

[Where the widow re-marries she is allowed as a final payment three times the annual payment made to her.]

For each child until fifteen years of age 15 per cent.

For an orphan without father and mother 20 , ,

For other relatives, if the deceased was their sole support. 20 , ,

The injured can be placed in a hospital at the expense of

the corporation. In that case this family has a right for the duration of this term to the same remuneration that would have been due to them in case of his decease.

The general results of the total expenditure for the eight corporations representing the iron and steel industries are shown in abstract in the following table for each of the five years of the period under consideration :—

TABLE V.—*Heads of Expenditure, 1886 to 1890.*

	1886.	1887.	1888.	1889.	1890.
Indemnities and pensions . . .	£ 12,278	£ 42,377	£ 68,086	£ 93,795	£ 123,647
Cost of inquiry . . .	654	1,396	2,056	2,485	3,435
Cost of referring disputed claims } (<i>justice arbitrale</i>) . . . }	975	1,701	1,844	2,245	2,472
Cost of the service for prevention } of accidents . . . }	660	1,664	2,502	2,587	2,880
Cost of first establishment . . .	1,594	2,628	1,049	1,729	119
Current expenses of administration	10,920	14,108	15,589	17,095	18,945
Carried to reserve fund . . .	36,835	84,754	102,137	93,547	98,860
Total annual expenses . . .	63,919	148,631	193,265	213,486	250,360
Total annual receipts . . .	79,719	165,045	212,285	240,200	282,564
Amount of reserve fund at end } of each year . . . }	37,166	122,367	326,965	321,504	433,851

According to statistics collected by the Imperial German Bureau for insurance against accidents, there were in 1887 2288 workmen injured, and 231 killed in the German iron and steel industries out of a total of 493,157 insured. The total amount paid to these as wages was £20,401,000, and the total sum paid as indemnities or compensation for accidents was £68,080, or about 0·3 per cent. of the total amount paid as wages. If the iron, steel, and allied industries of this country were called upon to pay at the same rate, the amount that they would have to expend in respect of their 1,409,889 workers, and the eighty-one millions computed as being paid as wages, would be about £295,000.* The annual revenue of the miners' permanent

* This amount applies to compensation alone, and does not include working expenses or other outlay, which in the German system—not including the amount carried to the reserve fund—was some £34,000, or about half as much as the sum expended on compensation.

societies alone in 1890 amounted to over £242,000, and the average expenditure of the same societies over the last six years has been about £171,000, mainly incurred in providing for cases of accident. There are no actual figures as to the sum expended in meeting accidents in the iron and steel industries proper of the United Kingdom.

The carefully-kept records of the German Government show, besides, that for each 10,000 workmen employed in the iron and steel industries, it has been necessary to pension 3.16 widows, 7.14 children, and 0.38 other relatives, as compared with 4.90 widows, 10.95 children, and 0.51 other relatives for industries generally.

Of the 2288 workmen engaged in the iron and steel industries that were injured in the course of the year, 257 were cases of burning, and 2021 were cases of fractures or contusions. The iron and steel industries show the largest absolute number of accidents from burning, but the relative proportion, which was 11.23 per cent. of the total number of accidents, was not so large as in the chemical industry, which showed 21.70 per cent., nor as in the sugar industry, which showed 15.19 per cent. of the whole. The iron and steel industries come after building and mining industries as regards the absolute number of fractures and contusions.

VI.—THE WORKING OF THE EMPLOYERS' LIABILITY ACT.

The Employers' Liability Act of 1880 marks a new departure in the history of the relations of employers and employed in this country. It is not necessary that I should refer at any length to the provisions of that Act, the more important of which are sufficiently well known. The Act placed the question of the liability of employers on a much more definite footing than it had formerly occupied. The great bugbear of the Act has been the question of the liability of the employer to the payment of compensation for accidents caused by another workman. The question of how far employers and employed should be at liberty to contract themselves out of the Act—that is to say, to make arrangements that would render

workmen unable to bring any action—has also led to much discussion, and neither of these points can be regarded as finally settled. The Select Committee of 1886 reported that “a general concurrence of opinion was expressed (by their witnesses) as to the advantages which the workmen have received from the existing Acts,” and that “the apprehensions as to its possible results in provoking legislation and imposing heavy charges upon employers have proved groundless, while a useful stimulus has been given to the establishment of provident funds and associations, in many cases liberally supported by the employers.” The Select Committee made several suggestions with a view to the adoption of further legislation, and especially as to two points, namely:—

1. That no contract made or entered into with a workman shall be a bar, or shall constitute a defence to an action for the recovery of compensation under the Act, unless it is based on the consideration of the employer having contributed to an insurance fund for the benefit of such workman against every accident arising in such employment; and
2. That wherever an employer enters into a contract with an independent contractor, or wherever such contractor enters into a contract with a sub-contractor, such contract or sub-contract shall not bar the liability of the employer.

There are many different agencies in operation for meeting the liability of employers under the Act of 1880. The Employers' Liability Corporation and other similar offices undertake to relieve the employer from liability on payment of certain specified premiums, which vary, according to the more or less dangerous character of the employment, from 1s. to 4s. 6d. per £100 paid as wages. There are besides provident and other funds established for the purpose of relieving employers on the one hand, and assisting workmen who have suffered injuries on the other. One of the most important of these is the Central Association for dealing with distress caused by mining accidents, constituted in 1879, for the purpose of forming miners' permanent

societies in districts where they had not already been established. In 1885, according to the evidence of its secretary,* this society had a membership of 209,306, an annual income of £161,815, and an accumulated fund of £234,483. The number of widows then receiving annuities was 1564, the number of children 3064, and the number of disablement cases dealt with during the year was 34,878. At that date 82,916 members of these societies had entered into arrangements with their employers, and 126,390 had not. The contributions of the miners vary from 2d. to 3d. and in some cases 4d. per week, and the employers contribute a percentage of the amount subscribed by the men. The men, when incapacitated, are allowed from 7s. to 10s. per week, and widows have an uniform allowance.

The returns that have been issued from time to time of the amount of litigation that has taken place under the Act of 1890 would appear to indicate that the great majority of the claims made must be settled amicably. The amount that has been annually awarded, in respect of legal claims brought under the Act of 1880, has not often exceeded £12,000 to £20,000 in England and Wales. The amount expended in legal costs is not so readily ascertainable, but it must have been considerable. It would certainly be desirable to get rid, if possible, of this item of expenditure, which can benefit nobody. The way to dispense with it has not yet, however, been made perfectly clear under any voluntary system, and the adoption of a State system, like that of Germany, is hardly likely to meet with approval in a country like this.

Mr. Chamberlain, in a speech delivered on Thursday of last week at Smethwick, made a proposal which, so far as it is intelligible from the report given in the *Times*, proposes to make the employer responsible for *all* accidents occurring through no fault of the workman himself; "but then," he adds, "I would require the employer to protect himself by insurance," and he

* "Minutes of Evidence taken before the Select Committee on Employers' Liability Act (1880) Amendment Bill," p. 247 (Q. 349a).

adds that “a very small insurance, amounting in the case of coal to a mere fraction of a penny per ton, would be sufficient to establish a fund from which all these compensations could be made.” Mr. Chamberlain goes on to speak of making the cost of this insurance fall ultimately on the consumer, as if the coal-owners had absolute control over the selling price, and could make it either high or low at pleasure, apart from the operation of the laws that regulate prices. He does not appear to be aware that 269,000 members of miners’ permanent societies now provide, with employers’ contributions, an annual revenue of £242,000. But less than 44 per cent. of the total number of men employed under the Coal Mines Acts are at present in membership with these societies, so that there are still 344,000, or 56 per cent. of the whole, outside their pale. If these and their employers were to contribute in the same proportion of about 18s. per employé per annum, the total sum so subscribed would amount to £309,600, making, with the £242,000 of annual revenue raised by the miners’ societies at present, a total annual revenue of £551,600. This sum could hardly come within Mr. Chamberlain’s definition—a mere fraction of a penny per ton—although it would be less than the full amount of that humble coin per ton raised.

The Companies or Corporations that are accustomed to insure employers against the liability incurred under the Act of 1880 usually classify the risks according to whether the employment is dangerous or otherwise. One of the principal companies has four classes of risks and a special class, in which latter miners and railway employés are included.

VII.—THE EXTENT OF THE LIABILITY OF EMPLOYERS.

It is a moot point, and one that really lies at the very bottom of this interesting subject, how far employers should be made liable for accidents that they have not been directly instrumental in causing, and over which, it may be, they neither have

exercised, nor could very well exercise any control. We have seen that under the German law, the right of the workman to recover from the employer compensation for all accidents occurring while in his service is treated as one of those inalienable and natural rights that are as obvious as the right to the elective franchise. We have also seen that employers are in Germany not only compelled to meet this obligation, but are also required by law to contribute to the sick funds, and to the funds provided for the insurance of workmen against old age and infirmity, so that a triple burden is laid upon their shoulders. In other countries, however, and notably in our own, the workman is presumed to meet the two latter eventualities by his own care and forethought, and the employer is held responsible only for accidents that he has been more or less directly the means of bringing about. There is, as regards most accidents, a difficulty in determining the exact degree of responsibility involved in this occurrence, and it is often all but impossible, after the most minute inquiry, to determine whether an accident has happened from the default of the employer, from the default of the workmen, or from that numerous class of causes which may properly be tabulated as inherent in the character of the employment. I do not know of any accurate tabulation of the proportions of accidents under each of these heads in this country.

According to statistics presented in 1889 to the Reichstag by the German Government, the accidents occurring in the German Empire that were attended either by death or by total incapacity from work for more than thirteen weeks, were 15,970 in number, and were thus apportioned :—

		No. of Cases.	Percentage of Total.
<i>A.—Accidents attributable to employers :—</i>			
1. Defective machinery	·	1122	7·03
2. Inadequate rules	·	334	2·09
3. Insufficient precautions	·	1700	10·64
		—	—
Total	·	3156	19·76

		No. of Cases.	Percentage of Total.
<i>B.—Accidents attributable to workmen :—</i>			
4. Inattention to existing means of precaution	281	1·74	
5. Infraction of rules	825	5·17	
6. Negligence and drunkenness	316	1·98	
7. Inattention and want of skill	2634	16·49	
8. Defective arrangement of clothing	38	0·24	
Total	4094	25·64	
<i>C.—Accidents partly attributable to both :—</i>			
9. Absence of means of precaution and negligence	711	4·45	
10. Faults of fellow-workmen	524	3·28	
Total	1235	7·73	
<i>D.—Other Causes :—</i>			
11. Dangers inherent in work	6931	43·40	
12. Causes not well defined	554	3·47	
Total	7485	46·87	

According to this statement, it is clear that employers can be held directly responsible for only a very limited proportion of the accidents that occur in industrial callings. Only 19·76 per cent. of the whole number can be directly imputed to them, while 25·64 per cent. are due to faults of omission or of commission on the part of the workmen themselves, and 43·40 are due to causes inherent in the character of the work—that is to say, to accidents that no amount of care or attention on the part of the employer could have prevented. Of the accidents due to the workmen themselves, 16·49 of the whole were owing to inattention or want of proper skill, this being by far the greatest number arising from sources that could be directly traced to the *employés*. On this showing, it would appear to be a more than adequate contribution if employers subscribed one-third towards any provident or accident fund intended to meet cases of this kind. The principal source of accidents appears to be due to neither employers nor employed, but to the specially dangerous character of the employment, which is usually taken into account in fixing the wages to be paid. If an employer, in addition to paying this higher rate of wages, has also to accept the responsibility of accidents beyond his control, he is obviously paying twice over for the same thing. In putting it

thus, I am of course looking at the matter solely as a business relationship between employers and employed, without reference to any action that it may be deemed expedient to take on behalf of the State, as such.

VIII.—THE SPECIAL LIABILITY OF IRON AND STEEL WORKERS TO ACCIDENTS.

We have already noticed that the rate charged by Employers' Liability Assurance Corporations for the insurance against accidents of employers in our own industry is higher than the average. I do not know upon what actuarial statistics, if any, these rates have been fixed. Certainly, so far as I know, no definite returns of the accidents actually occurring in such works, over a large area, have been collected in this country. An attempt was made to do so by this Association in 1880, but the difficulty of procuring reliable or tolerably full returns was found so great, that no adequate result was attained. It is different in Germany, where the employers appear to be much more ready to make replies to inquiries of an industrial character, and where, in 1880, the *Verein Deutscher Eisen und Stahl Industrieller*—the German Society corresponding to our own—collected returns which showed the following average annual results for the three years 1878–79–80:—

	Average Numbers Employed.	Average Total of all Accidents.	Average Accidents per 100 Workmen.	Average Fatal Accidents per Annum.
In 154 Iron Works . . .	77,774	8,329	10.7	70.6
In 198 Engineering Works .	40,873	2,602	6.3	19.3

The great majority of the accidents tabulated in the second column of figures were of little importance. Of the total number occurring in iron works, 3,248 were incapacitated from work for less than one week, and 892 in engineering works. Only 350 in the former, and 133 in the latter categories, were inca-

pacitated for ten weeks and upwards. Put in another way, it appears that of the total accidents of all kinds, about 65 per cent. had been restored to work at the end of the second week, about 85 per cent. at the end of the fourth week, about 91 per cent. at the end of the sixth week, and about 95 per cent. at the end of the ninth week.

IX.—THE CHARACTER OF ACCIDENTS HAPPENING IN IRON WORKS, AND OF THE COMPENSATION TO BE PAID.

The foregoing figures have shown that the vast majority of the accidents occurring in iron and steel works are not of a very serious character, so that they do not entail any large amount of strain upon either the sick funds for which workmen, or workmen and employers conjointly, are responsible, nor upon any other provision made to meet such cases. There is often a serious amount of doubt and uncertainty involved in the settlement of the question of what amount of compensation is due to a particular class of accidents, and unless this matter is dealt with in a systematic and uniform manner, there is a liability not only to discontent and litigation, but to overpay one and underpay another. These difficulties are avoided by the adoption of a regular scale of payments proportioned to the several classes of accidents that are most liable to occur. Some such arrangement as this is in operation in many cases where accident assurance funds are carried on; but the cases are probably few in which the system is worked out so methodically as in the mining and metallurgical industries of Belgium, where, assuming a payment of 100 for cases that involve permanent incapacity, the scale of payments for other accidents is proportioned thus—

*Classification of Indemnities under the Belgian System of General
Provident Societies in the Mining Industries.*

	Percentage of the Amount of the Pension in first Category provided.
<i>Total incapacity—Category:—</i>	
1. Cases involving permanent incapacity, such as the loss of two eyes, of two arms, of two legs, &c.	100
<i>Partial incapacity:—</i>	
2. Loss of a leg or of an arm	75
3. Loss of a hand, a foot, or an eye	62
4. Loss of a finger, &c.	30
5. Loss of two bones of the index finger, &c.	15
6. Loss of the little finger, &c.	7
<i>Relatives:—</i>	
7. Father or mother	30
8. Father and mother	40
<i>Widows:—</i>	
9. When not remarried	40
10. When remarried, until remarriage only	40
<i>Children:—</i>	
11. Three children as a maximum, until 14 years of age, each .	10
12. Allowance during temporary incapacity	62

X.—CONCLUSION.

We have now seen that the principal industrial countries of the world have within recent years initiated, and more or less carried out, either permissive or obligatory arrangements in order to secure for workmen compensation or indemnities for accidents sustained in the course of following their employment. It is of obvious importance that the different systems devised with this end in view should be compared, in their cost, their efficiency, their liability or otherwise to avoid friction, and their general adaptability to the end in view. This is a work that it will hardly be expected that I should undertake at the present stage of our inquiry. Nor is it necessary or expedient that I should examine the various provisions of the Employers' Liability Acts, with which you are sufficiently familiar, and which could not be satisfactorily dealt with in a paper like this. My

purpose in undertaking to write this paper at all was to show that the provisions of that Act, in so far as they involve burdens upon employers, do not appear to be more onerous than those proposed or devised for other countries; and if I have submitted any facts or considerations that may tend to give hints calculated to improve the relations of employers and employed from this point of view, I shall be gratified and rewarded. It has long been the genius of our constitution to leave nothing to the action of the State that can be accomplished by voluntary effort, and I venture to think that such a principle is peculiarly applicable to a matter of this kind.

In the statement of the reasons which led to the promotion of the law relating to accidents to workmen in Italy, it is wisely set forth that "the rôle of the State is not to administer funds of this description, but to give to institutions carried on for that purpose the security, the guarantees, and the facilities of development which result from good legislation."

APPENDIX A.

Total Numbers Employed in the Iron, Steel, and Allied Industries in the United Kingdom in 1881.

Blacksmiths	147,000
Bolt and nut makers	8,823
Chain and anchor makers	5,116
Cutters	18,517
Hoopmakers, &c.	28,459
Engine and machine fitters	78,828
Engineers and machinists	47,731
Iron and steel workers	241,346
Ironstone miners	37,095
Machinists (undefined)	20,918
Millwrights	8,961
Mine service	4,658
Nail-workers	21,422
Shipwrights	44,057
Tin plate workers	38,937
Toolmakers	10,307
Wire-workers	10,230
Whitesmiths	12,251
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	Total
Coal miners (1890)	796,656
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	Grand total
	1,409,889

APPENDIX B.

Total Accidents in British Coal Mines, 1861 to 1890.

Year.	Explosions.	Falls of Coal and Roof.	In Shafts.	Miscellaneous Accidents Underground.	Surface Accidents.	Accidents of all Kinds.
1861	119	427	164	163	70	943
1862	190	422	137	332	52	1,133
1863	193	407	147	134	56	937
1864	94	395	184	125	69	867
1865	168	381	163	179	93	984
1866	651	361	162	203	107	1,484
1867	286	449	158	211	86	1,190
1868	154	445	132	204	77	1,012
1869	257	466	129	179	85	1,116
1870	185	411	129	186	80	991
1871	269	435	123	176	72	1,075
1872	154	456	155	217	78	1,060
1873	100	455	157	200	82	994
1874	166	375	143	197	97	978
1875	287	420	154	200	97	1,158
1876	94	431	121	133	104	883
1877	341	421	124	172	93	1,151
1878	586	443	104	149	84	1,366
1879	184	400	115	163	69	931
1880	496	436	88	160	84	1,264
1881	114	419	102	180	84	899
1882	244	436	110	202	88	1,080
1883	134	440	92	231	104	1,001
1884	60	463	84	202	89	898
1885	341	419	67	213	74	1,114
1886	129	439	82	178	85	913
1887	146	458	84	207	76	971
1888	48	457	74	199	83	861
1889	133	458	64	291	94	1,045
1890	290	423	84	243	102	1,142
Total	6,618	12,848	3,632	5,829	2,514	31,446

APPENDIX C.

EMPLOYERS' LIABILITY ACT.

CHAPTER 42.

An Act to extend and regulate the Liability of Employers to make compensation for Personal Injuries suffered by workmen in their service.

[7th September, 1880.]

BE it enacted by the Queen's most Excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons in this present Parliament assembled, and by the authority of the same, as follows:—

1. Where after the commencement of this Act personal injury is caused to a workman,
 - (1.) By reason of any defect in the condition of the ways, works, machinery, or plant connected with or used in the business of the employer, or
 - (2.) By reason of the negligence of any person in the service of the employer who has any superintendence entrusted to him whilst in the exercise of such superintendence ; or
 - (3.) By reason of the negligence of any person in the service of the employer to whose orders or directions the workman at the time of the injury was bound to conform, and did conform, where such injury resulted from his having so conformed ; or
 - (4.) By reason of the act or omission of any person in the service of the employer done or made in obedience to the rules or bye-laws of the employer, or in obedience to particular instructions given by any person delegated with the authority of the employer in that behalf ; or
 - (5.) By reason of the negligence of any person in the service of the employer who has the charge or control of any signal, points, locomotive engine, or train upon a railway

the workman, or in case the injury results in death, the legal personal representatives of the workman, and any person entitled in case of death, shall have the same right of compensation and remedies against the employer as if the workman had not been a workman of nor in the service of the employer nor engaged in his work.

2. A workman shall not be entitled under this Act to any right of compensation, or remedy against the employer in any of the following cases ; that is to say,

- (1.) Under sub-section one of section one, unless the defect therein mentioned arose from, or had not been discovered or remedied owing to the negligence of the employer, or of some person in the service of the employer, and entrusted by him with the duty of seeing that the ways, works, machinery or plant were in proper condition.
- (2.) Under sub-section four of section one, unless the injury resulted from some impropriety or defect in the rules, bye-laws, or instructions therein mentioned ; provided that where a rule or bye-law has been approved or has been accepted as a proper rule or bye-law by one of Her Majesty's Principal Secretaries of State, or by the Board of Trade or any other department of the Government, under or by virtue of any Act of Parliament, it shall not be deemed for the purposes of this Act to be an improper or defective rule or bye-law.
- (3.) In any case where the workman knew of the defect or negligence which caused his injury, and failed within a reasonable time to give, or cause to be given, information thereof to the employer or some person superior to himself in the service of the employer, unless he was aware that the employer or such superior already knew of the said defect or negligence.

3. The amount of compensation recoverable under this Act shall not exceed such sum as may be found to be equivalent to the estimated earnings, during the three years preceding the injury, of a person in the same grade employed during those years in the like employment, and in the district in which the workman is employed at the time of the injury.

4. An action for the recovery under this Act of compensation for an injury shall not be maintainable unless notice that injury has been sustained is given within six weeks, and the action is commenced within six months from the occurrence of the accident causing the injury, or, in case of death, within twelve months from the time of death ; Provided always, that in case of death the want of such notice shall be no bar to the maintenance of such action if the judge shall be of opinion that there was reasonable excuse for such want of notice.

5. There shall be deducted from any compensation awarded to any workman, or representatives of a workman, or persons claiming by, under, or through a workman in respect of the cause of action arising under this Act, any penalty or part of a penalty which may have been paid in pursuance of any other Act of Parliament to such workman, representatives, or persons in respect of the same cause of action ; and where an action has been brought under this Act, by any workman, or the representatives of any workman, or any persons claiming by, under, or through such workman for compensation in respect of any cause of action arising under this Act, and payment has not previously been made of any penalty or part of a penalty under any other Act of Parliament in respect of the same cause of action, such workman, representatives, or person shall not be entitled

thereafter to receive any penalty or part of a penalty under any other Act of Parliament in respect of the same cause of action.

- 6.—(1.) Every action for recovery of compensation under this Act shall be brought to a county court, but may, upon the application of either plaintiff or defendant, be removed into a superior court in like manner and upon the same conditions as an action commenced in a county court may by law be removed.
- (2.) Upon the trial of any such action in a county court before the judge without a jury one or more assessors may be appointed for the purpose of ascertaining the amount of compensation.
- (3.) For the purpose of regulating the conditions and mode of appointment and remuneration of such assessors, and all matters of procedure relating to their duties, and also for the purpose of consolidating any actions under this Act in a county court, and otherwise preventing multiplicity of such actions, rules and regulations may be made, varied, and repealed from time to time in the same manner as rules and regulations for regulating the practice and procedure in other actions in county courts.

“County court” shall, with respect to Scotland, mean the “Sheriff’s Court,” and shall with respect to Ireland mean the “Civil Bill Court.”

In Scotland any action under this Act may be removed to the Court of Session at the instance of either party, in the manner provided by, and subject to the conditions prescribed by section nine of the Sheriff’s Court (Scotland) Act, 1877.

In Scotland the sheriff may conjoin actions arising out of the same occurrence or cause of action, though at the instance of different parties and in respect of different injuries.

7. Notice in respect of an injury under this Act shall give the name and address of the person injured, and shall state in ordinary language the cause of the injury and the date at which it was sustained, and shall be served on the employer, or if there is more than one employer, upon one of such employers.

The notice may be served by delivering the same to or at the residence or place of business of the person on whom it is to be served.

The notice may also be served by post by a registered letter addressed to the person on whom it is to be served at his last known place of residence or place of business; and, if served by post, shall be deemed to have been served at the time when a letter containing the same would be delivered in the ordinary course of post; and, in proving the serving of such notice, it shall be sufficient to prove that the notice was properly addressed and registered.

Where the employer is a body of persons corporate or unincorporate, the notice shall be served by delivering the same at or by sending it by post in a registered letter addressed to the office, or, if there be more than one office, any one of the offices of such body.

A notice under this section shall not be deemed invalid by reason of

any defect or inaccuracy therein, unless the judge who tries the action arising from the injury mentioned in the notice shall be of opinion that the defendant in the action is prejudiced in his defence by such defect or inaccuracy, and that the defect or inaccuracy was for the purpose of misleading.

8. For the purpose of this Act, unless the context otherwise requires—

The expression “person who has superintendence entrusted to him” means a person whose sole or principal duty is that of superintendence, and who is not ordinarily engaged in manual labour :

The expression “employer” includes a body of persons corporate or unincorporate :

The expression “workman” means a railway servant and any person to whom the Employers and Workmen Act, 1875, applies.

9. This Act shall not come into operation until the first day of January, one thousand eight hundred and eighty-one, which date is in this Act referred to as the commencement of this Act.

10. This Act may be cited as the Employers’ Liability Act, 1880, and shall continue in force till the thirty-first day of December, one thousand eight hundred and eighty-seven,* and to the end of the next Session of Parliament, and no longer, unless Parliament shall otherwise determine, and all actions commenced under this Act before that period shall be continued as if the said Act had not expired.

* NOTE.—The Act has been extended.

DISCUSSION.

Mr. B. H. THWAITE said this was a subject which he had studied for some years, and he had written a book dealing with it. Were the subject of attempts to reduce the proportion of accidents to workpeople, thoroughly and voluntarily grappled with by employers themselves, he could conceive no action that would more effectively reduce the bitterness of feeling existing between capital and labour. He had in his work "On the Sanitary Arrangements of our Factories and Workshops," written some eleven years back, recommended as worthy of imitation the establishment of the association for considering the means of preventing accidents promoted by the Alsatian manufacturers of Mulhouse. The effect of this association of employers for considering the well-being of their men had been very fruitful indeed, and in the happiest sense; and as he had demonstrated at the Hygienic Congress last year, money expended in preventing preventable accidents or in securing a healthy condition for the workmen was money well spent, and returned a far higher rate of interest than unfortunately did the staple industries of to-day. Referring to Mr. Jeans' very important paper, which he was confident would have a far-reaching effect when its value was appreciated at its great worth, there were data given of a very remarkable character. The one item that he wished particularly to draw attention to was the astonishing uniformity in the yearly number of accidents attributable to falls of coal and roof. Looking at the years 1870, 1880, and 1890, the annual averages were respectively 416, 427, and 441 in a range of twenty years. Surely there was some explanation for that terribly fatal numerical equality. Was it the fault in the method of timbering? It had often suggested itself to

him—Why not use light T or angle steel sections for props instead of timber, which, if of the right quality, was, as he understood, becoming more and more rare, and, *pro tanto*, more expensive. A steel section of a special and appropriate form for the work might be made of light steel almost as cheaply as if of timber, and it would bend very considerably before breaking, whereas a timber bearing hardly gave any warning sign of collapse, but came down instanter—alas! too suddenly for the poor fellows beneath. Indeed, he could conceive of no more noble a purpose for a body of men to meet to discuss than that having for its object, among others, the prevention of accidents to miners, who, whatever their faults, were compelled to work outside the light of day, and when accidents occurred were caught like rats in a trap. The Belgian example of voluntary organisation described by Mr. Jeans was well worthy of our imitation. There was no doubt that such an association must have a great and salutary influence on the relations between the masters and the men, or, as more democratically expressed, between capital and labour. What combination or association could be better fitted to act as arbitrators on wages, hours of labour, and fiscal questions? Certainly no association would more immediately command the respect of the men. In this Belgian example given by Mr. Jeans, for the province of Liège alone, the administration expenses did not exceed 1·5 per cent. of the pension and relief expenditure. Had we any economic parallel to that? There was no doubt that metallurgic works were rather dangerous, and any one like himself, who had had experience in actual works of various metallurgic processes, realised at once the great danger that was partly attributable to the essential character or nature of the work or labour—that was the heat or high temperature of the operation and the thirst of the men, a thirst followed by salivation, not always, alas! with nature's pure antidote, but with another, to which the President was a sworn enemy—alcoholic drink.

The rather dangerous attributes of the employment became possibly and commonly very dangerous when the influence of liquor was on the men. An accident occurred, and the masters were held liable for an event which might never have occurred if the men had been sober. Was that just? Why not, therefore, join the Chairman in his crusade against the cause of perhaps 25 per cent. of the accidents that occurred? Employers would soon realise the enormous advantage that would follow continually sober labour. It would be far better if the means of prevention of accidents were voluntarily carried out by employers without any legislative inducement. Neglect to adopt remedies must in the long run compel legislative interference with the freedom of industry, and sometimes the application of those legislative enactments retarded industrial progress. Let employers therefore band themselves together to prevent accidents by every reasonable means in their power.

Mr. ANDREW CARNEGIE said that in America their workmen made larger earnings than in Europe, and they were generous to each other. They were very much behind Continental countries, and also Great Britain, he thought, in regard to organisation for assisting workmen in cases of accident. There was a general rule that whatever the workmen contributed, the employer should give as much. That was the rule in the establishments with which he was connected. Wherever a case of accident occurred, the men raised a fund, and the firm added to it an amount equal to the contributions of the men. In two of their works, however, they had beneficial societies organised—the firm contributing one half, and the men one half. He would like to call attention to a most important point in Mr. Jeans' very interesting and very valuable paper; was there any reason assigned for the progressive increase shown in the number of fatal accidents per thousand persons since 1886, when the Employers' Liability Act came into

operation. The figure then was 2·83; then it rose to 4·14, 4·35, and 4·71, till it reached 5·36 in 1890. Did that leave them to infer that, as men were insured and knew to a certainty that they were to be taken care of, there was greater carelessness on the part of the men? That was a most vital inquiry.

Mr. JEANS said that in a recent statement issued to the members of the *Comité des Forges de France* special attention was called to these figures, and the inference that was drawn from the figures was this, that the effect upon the workmen of knowing that they would be looked after if injured, and that their widows and children would be taken care of if they were killed, had been to make them more careless, and so to cause a larger number of accidents. He did not allege that himself, but he simply stated the fact that in France that inference had been suggested.

Mr. DEBY said that Mr. Jeans, in his very valuable and complete summary, had not mentioned one fact as regards Belgium. In that country, in the event of an explosion in a mine, the manager was liable to six months' imprisonment. Since that law had been passed, and the managers had been made responsible in that way, the accidents had diminished in the proportion of ten to one. If the manager were punished in the case of an explosion, he thought it would be to the benefit both of the men and of the companies. He thought that the responsibility of managers was not sufficiently great, and it ought to be made more stringent than it was. When there was an inquest held they generally managed to show that some workman opened his lamp, or lit a match for his pipe, or something of the kind, when possibly other causes had been at work. The law that had made more stringent regulations as regards managers had worked very well in Belgium.

Sir P. CUNLIFFE OWEN said he thought a good deal really turned upon the temperance of the men. Not only that, but

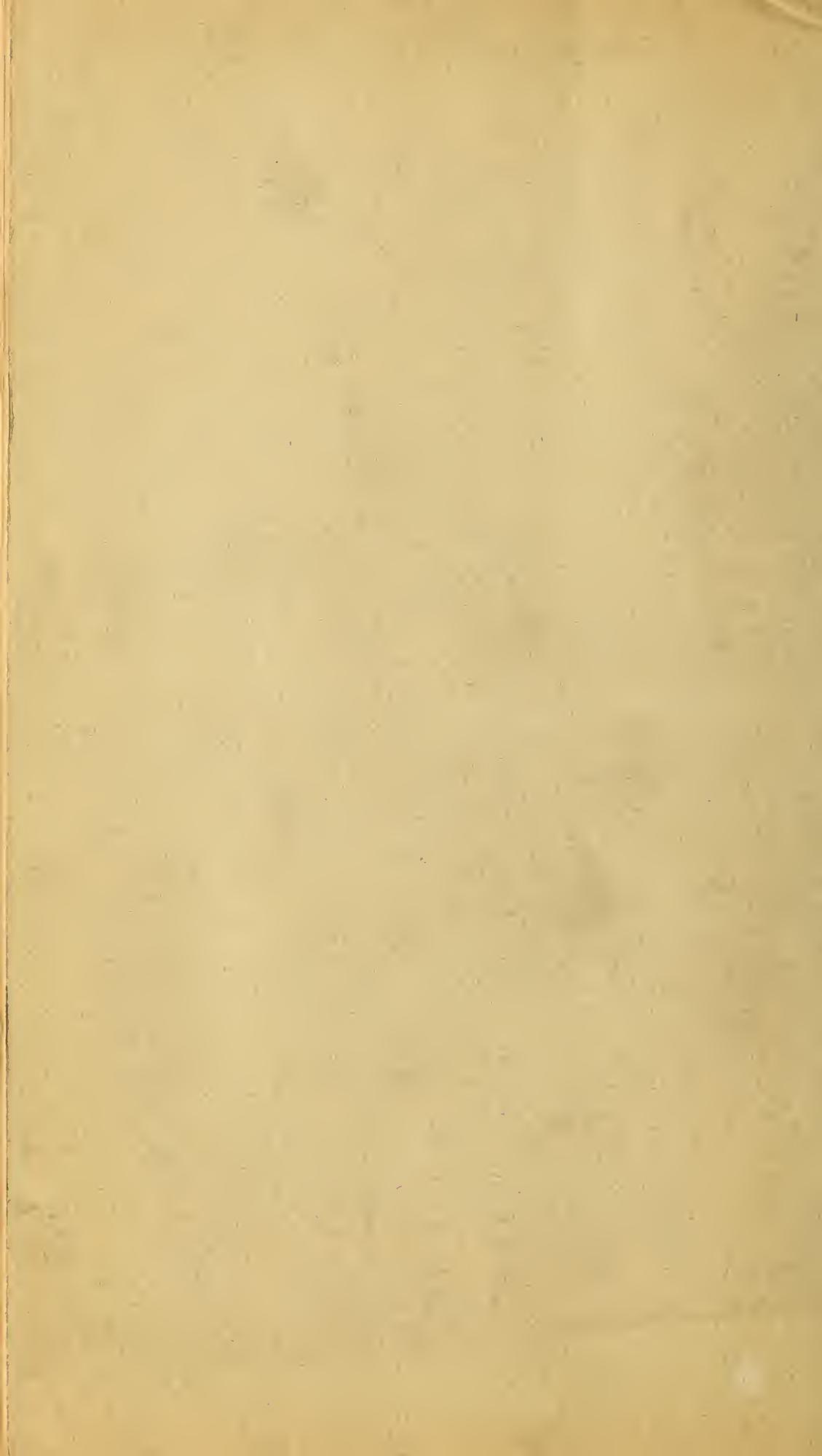
he thought it was an incumbent duty upon employers to see if they could not give an impetus to the question of temperance, because probably intemperance would really account for a great many of the accidents that took place. He was an abstainer himself, and he could not help saying a word in favour of what he was quite sure would be a very great benefit to the men, and, might he add, the employers too.

Mr. C. M. KENNEDY, C.B. (*Foreign Office*), on being invited by the President to speak, said he could not add anything to the very valuable information which had been given in Mr. Jeans' paper. He had come wholly unprepared for the discussion, and therefore was not able to refer to the authorities and statements mentioned in the paper, but having heard it read, it seemed to him a very valuable and lucid addition to our knowledge of the subject.

Mr. GEORGE CAWLEY said that the figures in the table referred to by Mr. Carnegie were really very astonishing, and they would seem to show that the German State insurance really led to industrial slaughter, because the death-rate had more than doubled in five years. If those were non-fatal accidents, he dared say that an accident insurance expert would explain them, but as these were fatal accidents, one could hardly imagine that a man would be tempted by the compensation to be paid to go out of his way to get killed. Mr. Jeans' paper was extremely valuable, and every employer of labour, he thought, owed him a debt of gratitude for it. The paper rather showed that the liability of the employer in England under the Employers' Liability Act was relatively very light. That was proved by the rates charged by various insurance companies for meeting this liability. In the case of cotton mills, he believed that the rate was something like 9d. per £100 paid in wages, which was really a very small sum, and amounted to something like a thirtieth of 1 per cent. of the sum paid in wages. From figures which he happened to possess, he found

that where a certain sum, say half the wages, was paid to a workman when injured, or £100 to the representative of the man when killed, the number of accidents reported under that system were about twelve times the number that were reported under the Employers' Liability Act, where the employer was simply liable. So he thought the Employers' Liability Act had really done good service, but any arrangement providing workmen with compensation in case of every accident, should be carried out really by the employers themselves rather than by the State. He thought that the Employers' Liability Act, on account of its provisions, really kept the employer fully alive to any defect in his plant.

The proceedings then terminated.



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